THE ARCHITECTURAL FORUM

FOR QUARTER CENTURY THE BRICKBUILDER

MAY 1917

DEVOTED TO THE ART AND SCIENCE OF BUILDING
ROGERS AND MANSON COMPANY PUBLISHERS

THE ARCHITECTURAL FORUM

VOLUME XXVI — NUMBER 5

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LETTERPRESS

Published Monthly by

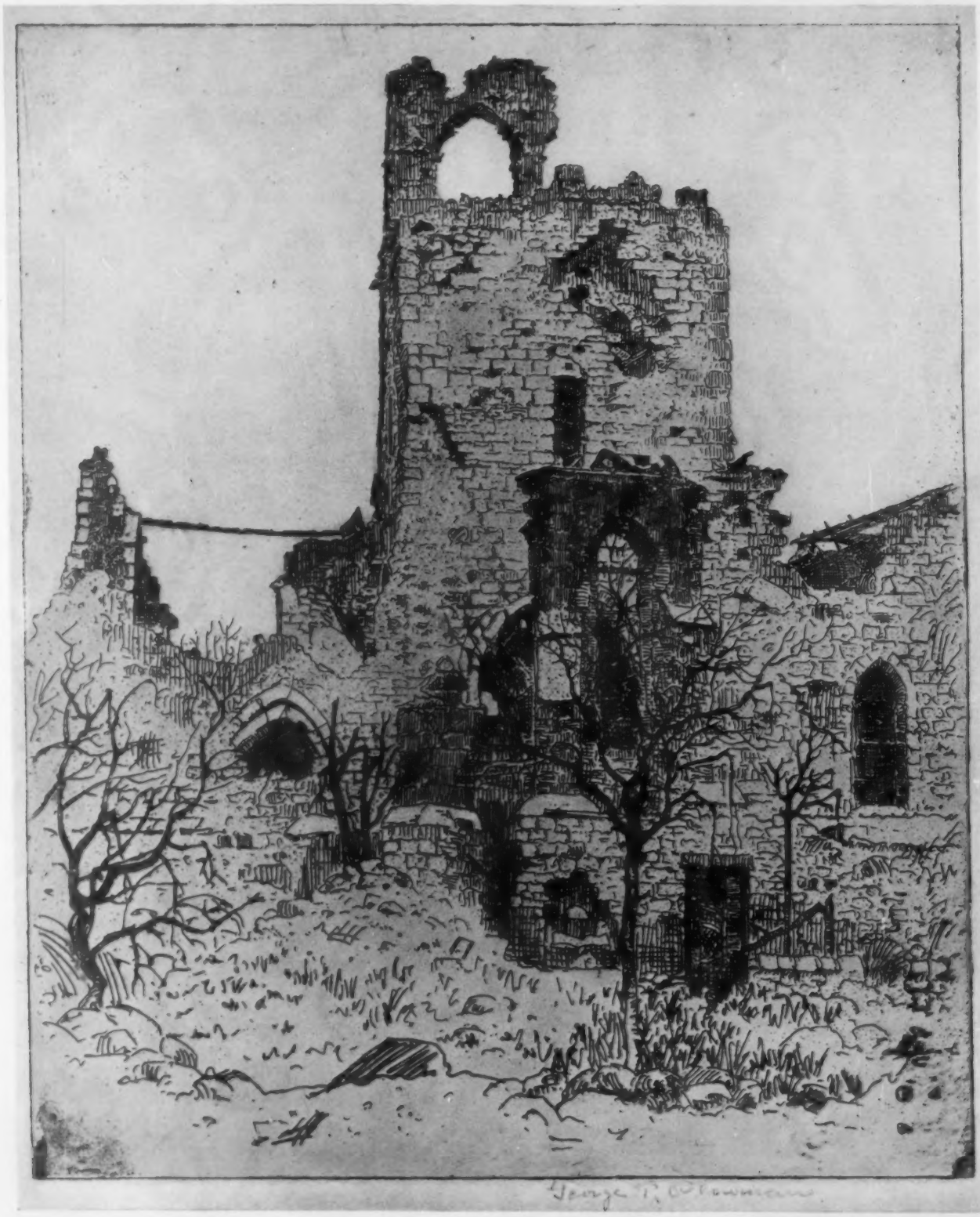
ROGERS AND MANSON COMPANY

85 Water Street, Boston, Mass.

Advertising Department, 42 West 39th Street, New York

Yearly Subscription, payable in advance, U. S. A., Insular Possessions and Cuba $5.00
Canada ..... $5.50 Foreign Countries in the Postal Union 6.00
Single Copies ..... 50 cents All Copies Mailed Flat

Trade Supplied by the American News Company and its Branches. Entered as Second Class Matter, March 12, 1892, at the Post Office at Boston, Mass.



RUINS OF THE CHURCH OF BETHENY, NEAR RHEIMS, FRANCE

AFTER AN ETCHING BY GEORGE T. PLOWMAN

This was one of the French parish churches located near Rheims to suffer destruction from the repeated shelling of the city and its noted cathedral.

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VOLUME XXVI MAY 1917 NUMBER 5

Economy in Relation to the Plan, Design, and Construction of Small Country Houses

By FRANK CHOUTEAU BROWN

IT IS greatly to be regretted that the architectural profession has not more conscientiously given of its experience to study the problem of the low cost house, because nowhere are skill, efficiency, and commonsense more necessary than when dealing with the problem of providing for a family of small means, where the expenditure of every dollar is to be most carefully considered. Especially is this the case now, when the rapid growth in the cost of materials and the great increase in labor cost—along with corresponding decrease in efficiency—are such obdurate factors in the building situation.

No architect who has had the problem of providing living quarters for a normal American family in an area that cannot exceed 800 to 1,000 square feet but realizes the true value of niceties of arrangement where the variation of an inch is to be considered as of importance in reducing staircase, passageways, closets, and bathrooms to an irreducible minimum, without occasioning absolute loss of efficiency. A house of 800 square feet, for instance, cannot include much more than four bedrooms and bath upon the second floor, along with a living room, dining room, and kitchen and pantries on the first floor. Within this area, room spaces have to be kept at their smallest possible limits, and yet such a plan need not be hackneyed nor conventional, and variations that will help in the proportion and sightliness of the house without increasing its expense are soon found to be possible, as shown in the plan (Fig. 1).

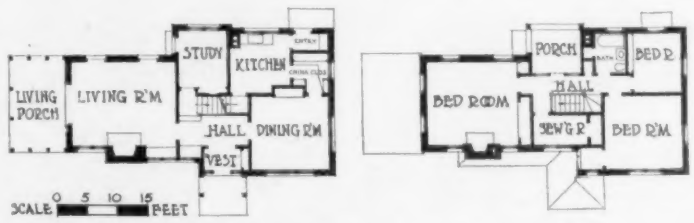


Fig. 1. Plan of good proportions having a floor area of 875 square feet, exclusive of living porch

While it has become almost a bromidium to state that the house of square outline is cheaper to build than the house of rectangular or unusual shape, yet careful analysis shows this statement to be only partially true. When it *is* possible to bring within a cube of nearly equal dimensions a convenient and satisfactory house arrangement, as in Fig. 2, it may be — other things being equal throughout—that, with the resultingly possible unbroken roof, certain essential savings would result, largely occasioned by the fact that the carpenters could then work with the least possible expenditure of time devoted to figuring out broken timber lengths, etc. Yet it should be realized that a house arranged as a thin and long rectangle, with a roof of but two slopes (as in the front portion of Duhring, Okie & Ziegler's side houses in the group shown on page 115), can be equally economical in the required expenditure of labor; and even the T-shape plan, as in Fig. 3, when comprised of similarly narrow elements, grouped under as simple an intersecting roof, could also be handled with equal economy.

The group of six houses, previously referred to, by Duhring, Okie & Ziegler, furnishes, in those at the side, an interesting and suggestive combination of the long narrow plan and the square cube, which latter arrangement is practically duplicated in the plan of the semi-detached house at the rear.

The only element of additional cost in the oblong plan would come from any additional amount of exterior wall construction; yet, when it is realized that the square cube of a house contains just as many running feet of wall construction for enclosing the same number of rooms as the long rectangular plan, the only difference being that in the one case the walls are interior walls and in the other case exterior, it can readily be seen that the net difference in cost between surfacing both sides with lath and plaster, and surfacing one side with lath and plaster, and the other with exterior plastering, clapboarding or whatever, must differ, if at all, by only a comparatively narrow margin.

Indeed, a plan of irregular contour, even of irregular angles, as in Fig. 4, can yet be planned so as to be as economical as the simpler rectangular structure, especially if by this arrangement obvious savings in hall or other waste spaces inside the house plan can be secured, besides obtaining by this means a better, more healthful, and more sightly exposure for the various rooms. This is especially true of the L- or T- shape plan, for instance, which makes it possible to give each important room exposure, light, and air upon three of its four sides, as in Fig. 5. The net increase in livableness in the house

that results, is also *quite* worth while being stated in terms of dollars and cents. Of course, it is essential, in any plan of inexpensive type, to reduce window and door openings to the minimum, and to plan all partitions without irregular breaks and eccentricities, and also arrange them so that the bearing partitions shall be equally consistent and simple throughout, as in Figs. 1, 5, and 13. A further due consideration for the lengths of lumber used, both floor joists and studs, with a realization of those points where the price increases out of due proportion with the increased length obtained, is also advisable, and a similar knowledge in regard to standard sizes of doors, windows, and glass areas should not be neglected by the designer conscientiously striving to obtain the utmost of return upon his client's investment.

The writer is convinced that, difficult as it is to estimate the matter of cost on a plan, the ordinary basis of a square foot area or cube is a crude, and often misleading, method of approximation, only to be availed of in the most snapshot judgment, or when more exact methods are, for one reason or another, incapable of application. To recognize the fallacy of the method based on the square foot unit, for instance, it is only necessary to consider increasing the same plan by 300 square feet added area to realize that, while the area has been increased perhaps by 25 per cent, the actual cost has only been increased by about 10 per cent, because the same number of angles, partitions, doors, windows, etc., are still retained. The cubic foot price is equally misleading, because it includes the cellar and the attic or roof space — both sections where ordinarily the least expense enters into the cost of the small size dwelling. And both methods are deficient in that neither takes into consideration the type or quality of the finish, interior or exterior.

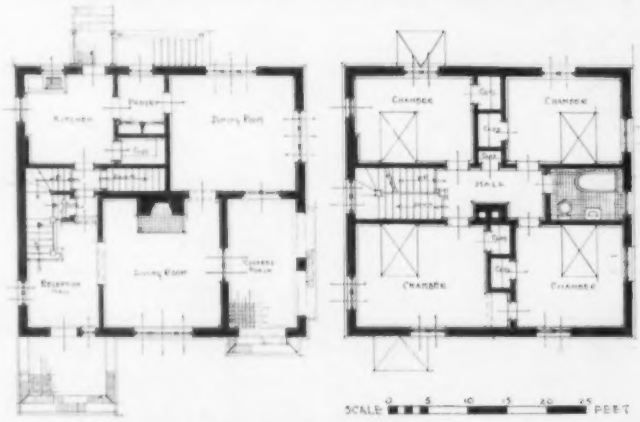


Fig. 2. House of A. E. Lindan, Jr., Esq., St. Louis, Mo. A compact square plan having an area of 1,224 square feet, including porch
Roth & Study, Architects

Considerable experience serves to convince one that far more can be done to keep the price of a house down if, in the first place, the greatest *possible* simplicity in the plan arrangement itself is maintained, with the fewest possible number of partitions, angles, window and door openings; the span of the rooms kept as moderate as possible, bearing in mind the thickness and size of the required floor joists; the story heights kept low; the finish and painting simple; the plumbing restrained to one perpendicular stack taking care of all the stories, and the chimneys limited to two, or, where possible, one. And yet, after all, the *arrangement* of the floor plan, bearing in mind always the ease and rapidity with which the frame can be laid out and erected, is the predominating feature. With the partitions arranged in a simple and direct manner, it does not make so much difference whether they are inside or outside partitions. If the exterior wall is faced with an expensive material, it is merely necessary to reduce its lineal running feet as much as possible in relation to the plan that is desired; and if of masonry, requiring lintels for supports over openings, to lower the eaves and roof to a point where the second story lintel over all openings becomes unnecessary (as in the house shown on page 135). The allowable grouping of the openings throughout is also important, with other elements, in simplifying the construction and correspondingly reducing the cost.

In the small house of frame construction, money can be saved in labor by framing the elevations with studs running from sill to plate, using a ledger board to support the second story joist, or employing some variation of the "balloon frame" type of construction prevalent in the West and Middle West. Despite its ill name, the "balloon frame," provided the house is not over large and sufficient braces are placed in the corners, is an economical and not unsatisfactory method of framing woodwork. Experience has shown, indeed, that when the exterior of a house is plastered, it is preferable to run the studs through from sill to plate without break, rather than interpose a wide girt at the second floor (as is required by many building laws), thus introducing a structural, and most unnecessary, element of shrinkage. If the third floor joists can also be so planned as to rest directly upon the plate, a further saving in labor is effected, and it is almost as cheap, though hardly as good construction, to frame the attic floor joists on the plate topping the partition and cut another plate to carry the roof rafters into the top edge of the same joists, the objection again being the element of shrinkage introduced in the thickness of the joists. Yet with certain types of cornices the connection with the wall could be provided for in the

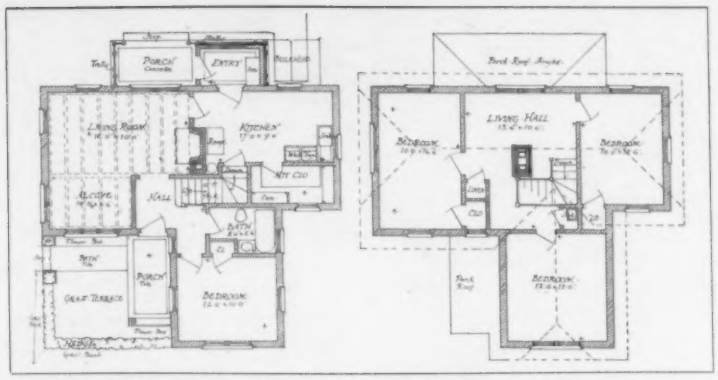


Fig. 3. T-shaped plan of simple elements having an area of 940 square feet, exclusive of porches

design, so that even this need not be considered as an objectional feature. When rooms can be so dimensioned as to permit the use of floor joists of exactly 10, 12, or 14 foot lengths, including their bearings on partitions, that will help to hold down the expense — just as story heights that make use of studs of the regular dimension lengths between partition cap and sill also help in saving expense. In order to accomplish these results, it is merely necessary for the designer to work out his construction sections first, and then figure his lengths and heights, rather than follow the more customary reverse process.

In a house of masonry wall construction, especially when employing terra cotta blocks, it should be possible to base the heights of the stories and the window openings on the natural joints between these block units. It is also desirable to bear in mind that, with exterior masonry wall construction, economy can always be effected by certain means. First, the grouping of windows; second, the elimination — where possible in the design — of masonry lintel supports over wall openings; and also the necessity for always keeping the masonry wall heights as low as possible, — by lowering the eaves, omitting gables, and even bringing parts of the second story into the roof, with dormers, or by some other means.

The structural employment of terra cotta blocks is good practice and furnishes a wall having many distinct advantages. In small house work it is essential to select a mason contractor who is familiar with the material, if the cost of this construction is to be kept to the lowest figure. The combination of stucco with concrete block is an unusual method, and one that hardly seems to be justified by most conditions. If a concrete block is to be employed as a base for stucco, by giving it a proper texture in the first place it might as well be left for the finished surface; and if a different color is desired, it can most easily and cheaply be obtained by using an exterior plain or tinted lime wash to effect that purpose, as is so often done in England on stone or brick masonry walls.

It is also obvious that, whether the walls are of masonry or wood, the fewer angles in the construction required by the plan (and especially the fewer angles other than right angles) the cheaper will be the labor bill on the dwelling. This is, of course, one of the economies of the square or rectangular house plan. Variable as are building costs at the present time, it can yet be stated generally that the cost of the frame-and-shingled and frame-and-clapboarded house wall is now more nearly equal in most localities than it was a few years ago, the difference being either made up or overcome by the item of painting necessary for the maintenance of the clapboarded wall.

It is also coming more and more to be recognized that the shingled wall is more appropriate to the summer cottage, just as painted clapboarding is more appropriate to the suburban house. In fact, the shingled wall in the suburb depreciates the investment more rapidly than any other element in the design, because it marks the house, from the very day of its closing in, as belonging to a period of some ten or twelve years ago; whereas, if properly designed, a stucco house will not even begin to acquire age for several years after it has been built. Frame and stucco, provided the architect has taken into account the element of cost and so arranged his plan and exterior details as to make for economy in the use of the material, now costs but very little more than any exterior wooden treatment of the

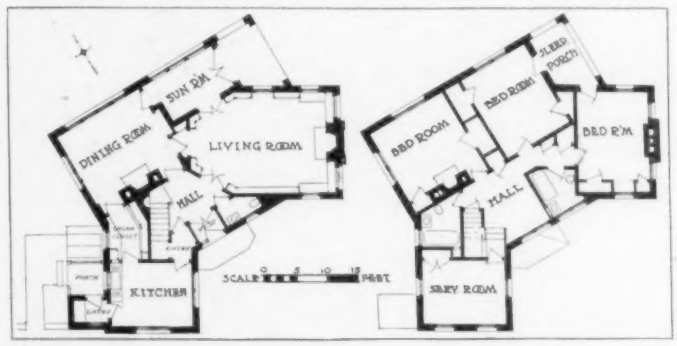


Fig. 4. An irregular angle plan having an area of 1,316 square feet, including porches

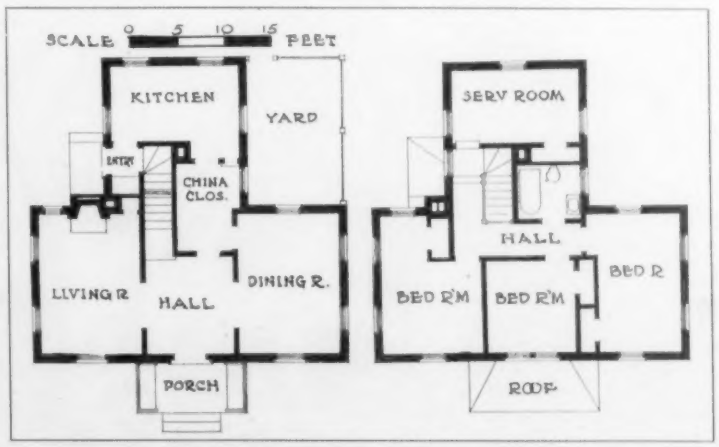


Fig. 5. T-shaped plan in which principal rooms have exposure on three sides
Floor area 750 square feet

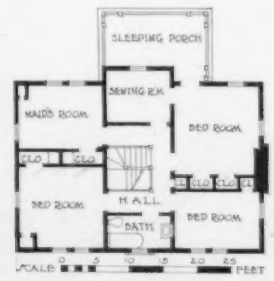
house wall. On the very small house this difference may reach as much as 4 per cent; on the larger house, with simple wall surfaces, it can probably be reduced to 2 per cent, or even less.

Where brick is an essential element in the exterior design of the house, it can still be cheapest used as an applied veneer outside the face of the frame, when it need cost no more than a plaster stucco face, and its intelligent employment in this way can give all the character of the solid brick wall and increase the investment value for the owner proportionately. The material has to be properly used, however, and it is still surprising to find so little intelligence exercised, either on the part of the general public or the architect, in employing brick as an element in the design of a house. It is unfortunately still true that the majority of brick houses are just soggy lumps of inanimate clay, with no interest of texture, jointing, bond or color indication to show their real value or express the human interest of the material. All these factors can be included in the house design without introducing any new element of expense, excepting only some of the more complicated bond arrangements that do require additional labor and more pains and skill on the part of the masons.

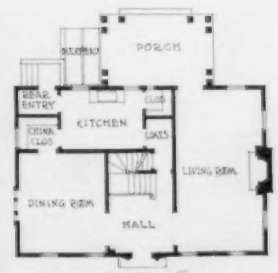
Tile, brick, or concrete can be substituted for the ordinary wooden porch floor at but slight additional expense if it is possible to lay them upon a cinder or gravel fill. A concrete floor, at least, costs practically no more than wood under these conditions, although it has generally but little beauty and, on certain exposures in summer, is likely disagreeably to reflect the sun into the interior of the house. Tile and brick can be used for borders, or mixed into a pattern with concrete squares or surfaces, and this will help materially in its appearance and also serve the structural purpose of taking care of the expansion and contraction of the material, thus eliminating unsightly cracks. The brick floor, laid in its simpler forms of basket or herringbone pattern inside a border of brick or tile, is the next cheapest form, except that sometimes panels of concrete can be incorporated into the brick design at some slight saving, and, of course, beyond this point there are many varieties of tile that can be employed to obtain many beautiful effects at a ratio of cost increasing as constantly as it is allowed.

The roof can itself be a considerable element in the cost of the building, particularly if it is much broken up by gables, dormers, etc., requiring much flashing and labor in cutting around and making tight these angles. Even the breaks in the gambrel roof at last are being recognized as representing an element of added cost only excused by the saving generally effected by substituting shingles for some more expensive wall material on the second story. The cost of this labor increases with the inflexibility of the material; where shingles can be fitted rather inexpensively, slate and tile cost more the thicker and larger they are. Inasmuch as the simple roof with long, unbroken lines is always the cheaper (and, generally, the more attractive), it should be employed by the designer, except in those situations where it is possible to save expense in the construction of second story masonry walls by extending the roof down to a lower eaves line.

This latter method is one that is little understood or utilized by American designers, although it is the method that has been employed most constantly by English architects — sometimes, it is to be confessed, to an extent that has a tendency to become both nervously overemphasized and to introduce an element of expense rather than economy into the whole design. It is, of course, allowable only with the house of English Tudor or Baronial descent and does not apply to the Georgian house design. And here, also, England furnishes us with a number of charmingly simple and interesting brick houses of the later Georgian period that have in some cases been used as models by English architects, but are as yet rarely appreciated in America, perhaps because of the very modest simplicity and unpretension of their exterior design. Yet



Second Floor Plan



First Floor Plan

House of Dr. Roger B. Taft, Belmont, Mass. Louis Grandgent, Architect

Walls of stud construction with siding on ends and stucco on front and rear. Floor area 925 square feet, exclusive of porch
Cost $7.00 per square foot

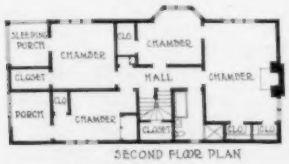
SECOND FLOOR PLAN

FIRST FLOOR PLAN

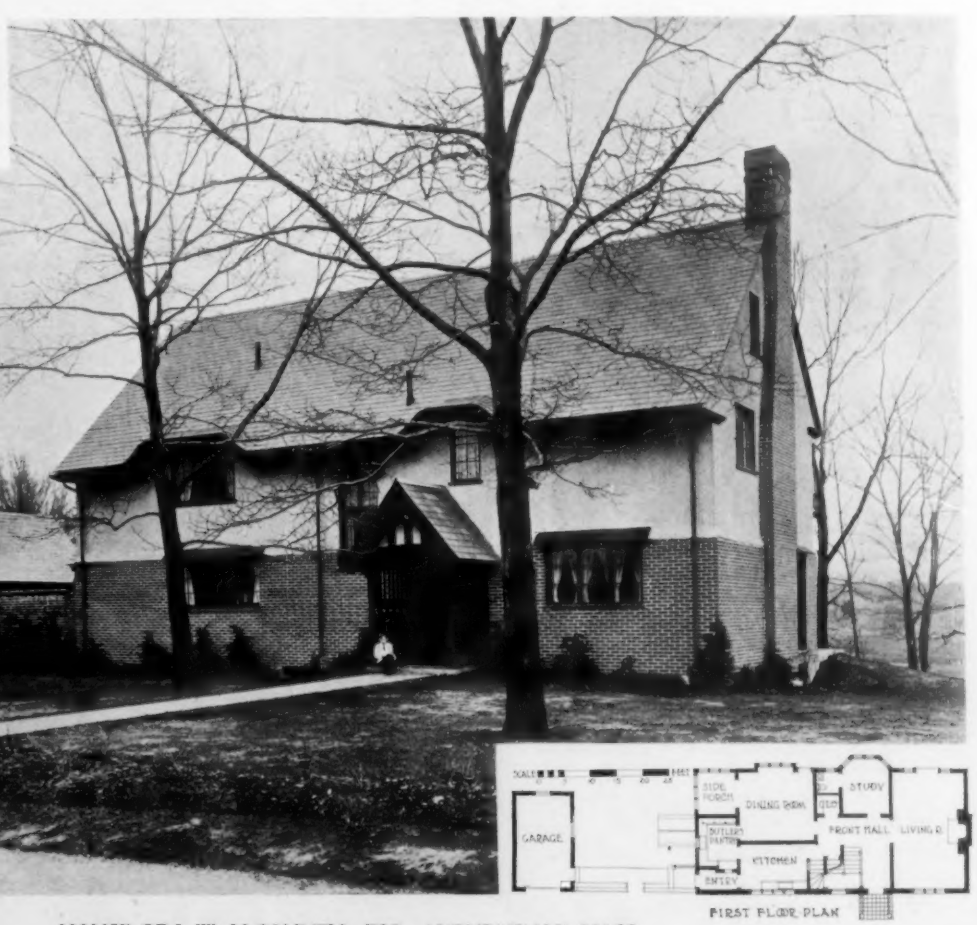
HOUSE OF JOSEPH R. DYER, ESQ., MILWAUKEE, WIS.

H. W. BUEMMING, ARCHITECT

Walls of frame construction, veneered with brick and 1½ inch thick stucco. Floor area, including sun room, 2,340 square feet. Cost $6.40 per square foot



SECOND FLOOR PLAN



FIRST FLOOR PLAN

HOUSE OF I. W. McCONNELL, ESQ., AUBURNDALE, MASS.

ALLEN W. JACKSON, ARCHITECT

Walls of frame construction with brick and stucco on wire lath veneer, roof of slate. Floor area including garage, 1,452 square feet. Cost $7.00 per square foot

these houses, using the simpler, more direct brickwork of the late Georgian period, similar to one or two of the houses around the Close at Salisbury, for instance, suggest nearly as inexpensive employments of this building material in an appropriate style as the radically different yet inexpensive use of brick modeled on some of the more modest cottage styles of English Tudor work which are perhaps the least expensive of available design. Illustrating the possibilities of this style are the attractive yet simple house designs by Duhring, Okie & Ziegler, Edward Palmer, Jr., and W. D. Lamdin that appear in this issue on pages 115, 147, and 160, respectively.

The cost factor introduced by the style selected for the building is an important one. Colonial finish, requiring delicate and especially fine mouldings around windows and doors and for cornices, is now regarded as introducing an item of added cost. In fact, it is difficult even to plan room interiors along the lines usually accepted by American householders without going into a very considerable element of expense in this matter, because we are not yet accustomed to eliminate this wholly unnecessary if customary, finish, and get down to the fundamental essentials of the construction, employing them with sufficient skill and feeling for proportion to depend upon them alone for the attractive appearance of our house exteriors and interiors; as is so generally done in the better class of English work, for instance. By eliminating the conventional and customary finish around doors and windows, necessary only in the wooden frame dwelling, it might conceivably be possible to build a fireproof wall and finish it inside and out at a cost no more than the same wall built of wood, plaster, and stucco, *plus* the cost of the finish and its carpenter labor and painting; just as, under normal conditions, it might be possible, by reducing the customary size of our windows to the net area actually used by the owner (after he has finished draping and shading his windows — in what is also the customary manner!), to get a metal frame sash for a price approximating the cost of the larger wood window opening, of which so small a proportionate amount is usually actually utilized.

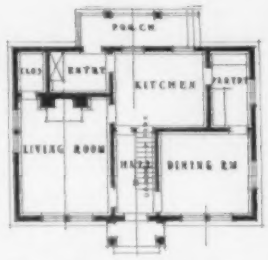


Fig. 6. Central hall plan of minimum area

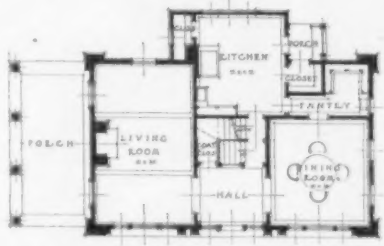


Fig. 7. Central hall plan enlarged by small extension at rear. Floor area 1,152 square feet, exclusive of porches

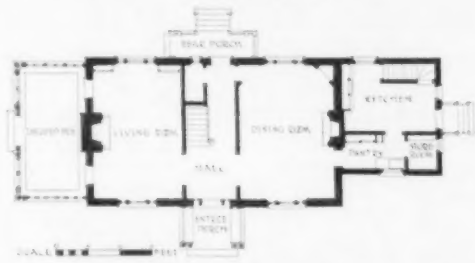


Fig. 8. Central hall plan having extension at side. Floor area 1,118 square feet, exclusive of porches

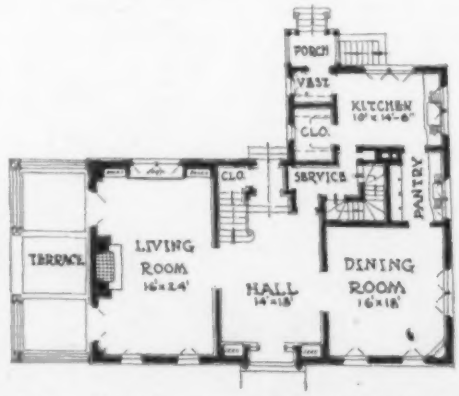


Fig. 9. Plan with rear extension providing more service space. Area 1,480 square feet, exclusive of terrace

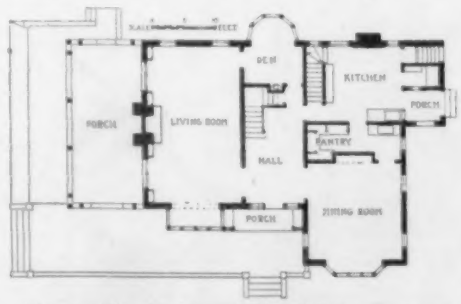


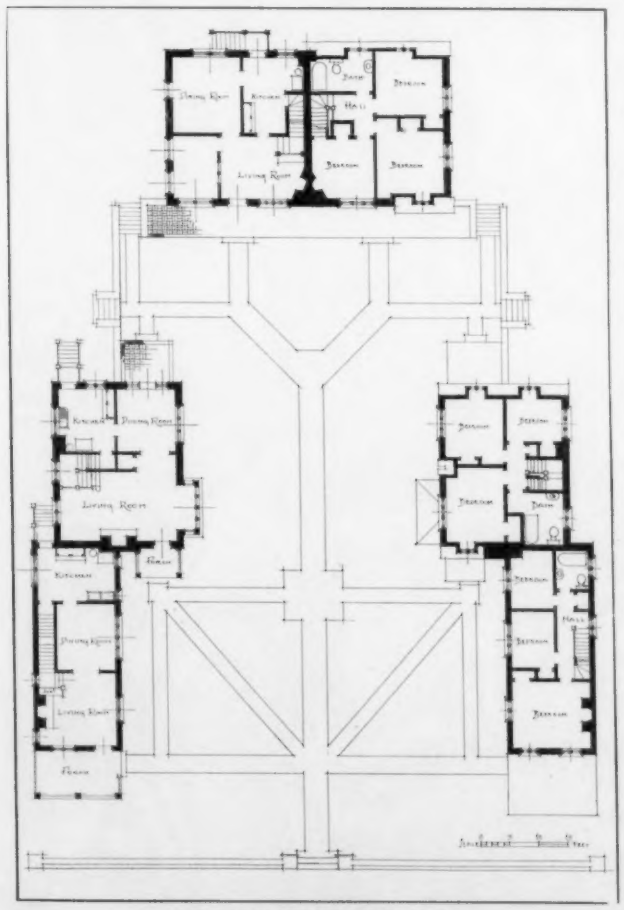
Fig. 10. Plan showing projection of dining room wing Floor area 1,385 square feet, exclusive of porches

We have said, the small house must have a simple plan. One of the simplest, though not necessarily the least expensive, is the plan with the living room on one side of an entrance doorway, the dining room upon the other, as in Fig. 6, with a kitchen and pantry located at the rear. Such a house can be easily contained within a parallelogram. The staircase can be variously arranged to run either at right angles with the door; to be recessed to one side, or run directly back to a rear window on the second floor, and either a three or four room second story plan and bath is equally available and obvious.

In enlarging this plan the first step is to project the service portion into a slight ell at the side, as in Fig. 8; or rear, as in Fig. 7; or in a more elaborate form, as in Fig. 9; or throw out the dining room in a projecting bay at the front of the house, as in Fig. 10, or both, as in the plan on page 150. If additional area permits, a study can be added at the back of the hall, thus increasing the house plan, as in Fig. 12. From then on the elaboration of the plan generally extends into ramifications running into ells or wings of various proportions and treatments, diverting from the central structure in one or another direction, according to the points of the compass and the conditions imposed by the site. Yet how conventional and restricted are the possibilities of this plan! To be sure, it is based in the main upon an evenly balanced façade, with the center door and porch that was originally imposed by the Colonial tendencies of the American householder. Once give the designer a chance to locate his entrance off the center of the house front, and many possibilities are open to him. Yet one of the most difficult problems remaining to be solved is the narrow suburban lot, requiring a house of correspondingly narrow frontage. When associated with the desire to maintain this frontage and outlook for the principal rooms, it at once becomes necessary to place the entrance part way down the side of the house, as in Fig. 11, for example.

An English Tudor exterior treatment makes it possible to simplify

GENERAL VIEW FROM STREET



FIRST AND SECOND FLOOR PLANS

VIEW OF SIDE HOUSE

VIEW OF CENTER HOUSE

First floor area of front portion of side houses, 468 square feet; rear portion, 634 square feet; and half of house in center, 675 square feet

GROUP OF HOUSES, WILLOW GROVE AVENUE, PHILADELPHIA, PA.

DUHRING, OKIE & ZIEGLER, ARCHITECTS

the entrance by avoiding an elaborate porch, such as is usual in Colonial work, and substituting for it a simple hood, a recessed or arched vestibule, or some other unobtrusive or appealing motive appropriate to the design. The most interesting and best of the small houses seen in American suburbs are easily those of this English type of inspiration, just as the more commonplace are generally those based upon the Colonial type of plan previously described.

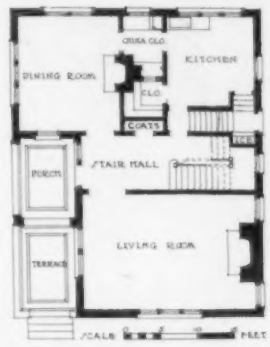


Fig. 11. Plan for lot of narrow frontage. Floor area 1,200 square feet

It is interesting to note that, where the Colonial plan with a central hall and stairs running from front to back of the house has long been a favorite, and often an unintelligent and thoughtless, arrangement, the plan of the small house is now receiving more attention, and new and very interesting variants are accordingly being discovered. One of these tendencies is to run the stairs at right angles to the entrance, as in the house at Framingham, shown on this page; or to go back to a favorite scheme of thirty or forty years ago and place them as part of a more spacious staircase or reception hall, as in Mr. Fowler's and Mr. Palmer's schemes (see pages 146 and 147); or that receives an even more typical treatment in Mr. Lamdin's diversified, and accordingly *not* inexpensive, plan (see page 160). Mr. Palmer's house also shows a type of plan that has recently become rather a favorite, with living room and dining room together extending across the entire back of the house. This is especially true where the house faces the north, as in this case; yet this logical solution, requiring the location of the kitchen on the street front of the house, however, has been long and determinedly resisted by many owners because of that very fact. The modern plan also calls for more and more bathrooms upon the second floor, thus introducing an element of expense in the plumbing that a few years ago did not enter materially into the house problem.

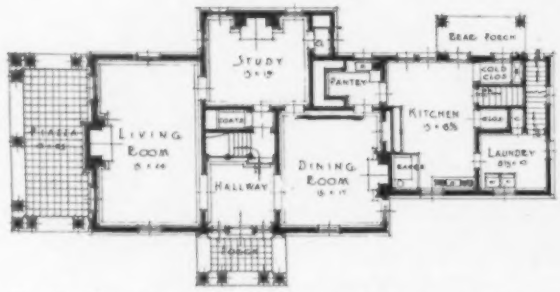
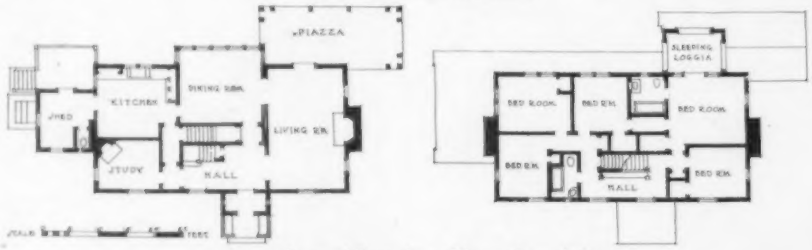


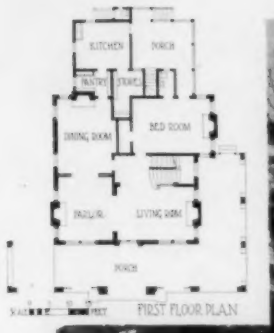
Fig. 12. Plan showing study added at rear of hall. Area 1,650 square feet, exclusive of porches



First and second floor plans of house shown below

But the architect is not the only person to be held responsible for the intricacy and expense of the dwelling house plan. The owner is here equally, if not even more, at fault. In how many small American houses, for instance, where the matter of expense is considered by the owner to be

House of Wm. E. P. How ell, Esq., Framingham Center, Mass. Charles M. Baker, Architect
Walls of stud and siding construction, roof of shingles. Floor area, exclusive of porches, 1,220 square feet. Cost 19 cents per cubic foot



HOUSE ON PEACHTREE ROAD, ATLANTA, GA.

A. N. CANTON, ARCHITECT

HOUSE OF A. A. BEEBE, ESQ., WINNETKA, ILL.

PERKINS, FELLOWS & HAMILTON, ARCHITECTS

of prime importance, is he yet found willing to eliminate unnecessary rooms and concentrate the space where it is most needed and most used in his family life? Once in a *long* while the owner can be persuaded to eliminate hall area, outside of the absolute space required for staircase, passageway, and entrance vestibule; yet he nevertheless persists in stipulating such conventional elements as the dining room, china closet, and kitchen pantry; and seldom can he be brought to realize the great economy in space possible from arranging the living room so that one end may be used as the dining room, as in Fig. 13, with a substitution of cupboard space — properly designed to be interesting elements in the decoration of the room — to open directly into the dining room or into the kitchen, or to communicate with both, thus saving the area of the dining room and much corresponding partition work and plastering. Yet the original English cottage, from which our present house plan derives, made these savings, along with the substitution of cupboards for closets upon the second floor, with their added greater convenience and saving of at least 50 per cent floor area, both important elements in the economy of the English cottage plan.

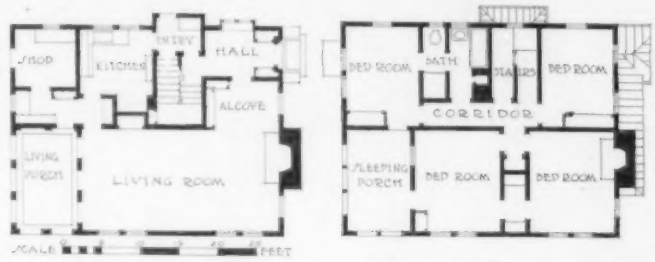


Fig. 13. Plan showing convenient arrangement with omission of conventional dining room. Area 945 square feet, including porches

To recapitulate, the principal elements in the inexpensive house are, first, the planning of its arrangement; second, the exterior and its design (with which is associated, of course, the "style" of the house to be adopted), the simplifying and location of the chimneys, the location of plumbing, the roof arrangement, and, finally, the finish and painting. The latter is an important factor in these days, and one of the elements that does much to run up the expense of building the Colonial house, with its necessary requirements of many coats of white paint on elaborate finish; whereas the English type of cottage is appropriately finished with simple woods, left in the natural color or stained, with an exterior surface of wax, thus saving both expensive labor and material as well. The plan once simplified, the area of the house cut down (the plan in Fig. 13, it should be noticed, nevertheless supplies even this small house with one large and livable room), the height of the story reduced to a comfortable proportion to the rooms' floor areas, saving the expense of construction, and, in winter, coal for heating bills — and we have laid the basis for a more economical type of dwelling than is usual, or customarily considered possible, by the small American householder.

There remains but one further economy to be practised, and that is to work, through co-operation, to subdivide and concentrate the profits — now necessarily to be secured on each building constructed by a contractor in scattered locations — that would practically be possible if one contractor could be carrying on, at the same time, a number of constructions of one architect in a group, and of different designs, in which case it would become possible for the architect to standardize many of his details so that much labor and shop work would be saved, with no loss of distinction to the individual houses. Here is the principal economy of building the low cost house, as the problem has been faced, and solved, in England.

Second Floor Plan

First Floor Plan

House of Mr. L. S. Dickey, Jr., Morgan Park, Ill. Chatten & Hammond, Architects
Walls of hollow tile with brick and stucco veneer. Floor area 1,947 square feet, including porches. Cost $7.75 per square foot

THE FORUM COLLECTION OF EARLY AMERICAN ARCHITECTURAL DETAILS

PLATE FORTY

THIS handsome china closet is hidden by a solid paneled door, which must be opened to reveal the beauty of the work behind it. No glass was used, in order that it might balance a similar door on the opposite side of the fireplace, giving to that end of the room a symmetrical composition.

The fluted shell is entirely of wood, as well as the semicircular wall in back of the shelves. The central projection of each shelf, in order to give added space, is interesting. The six-petaled rose carved in the key over the door is no doubt a survival of the Tudor rose tradition.

CHINA CLOSET IN THE WEBB-WELLS HOUSE, WETHERSFIELD, CONN.

Built in 1753

MEASURED DRAWING ON FOLLOWING PAGE

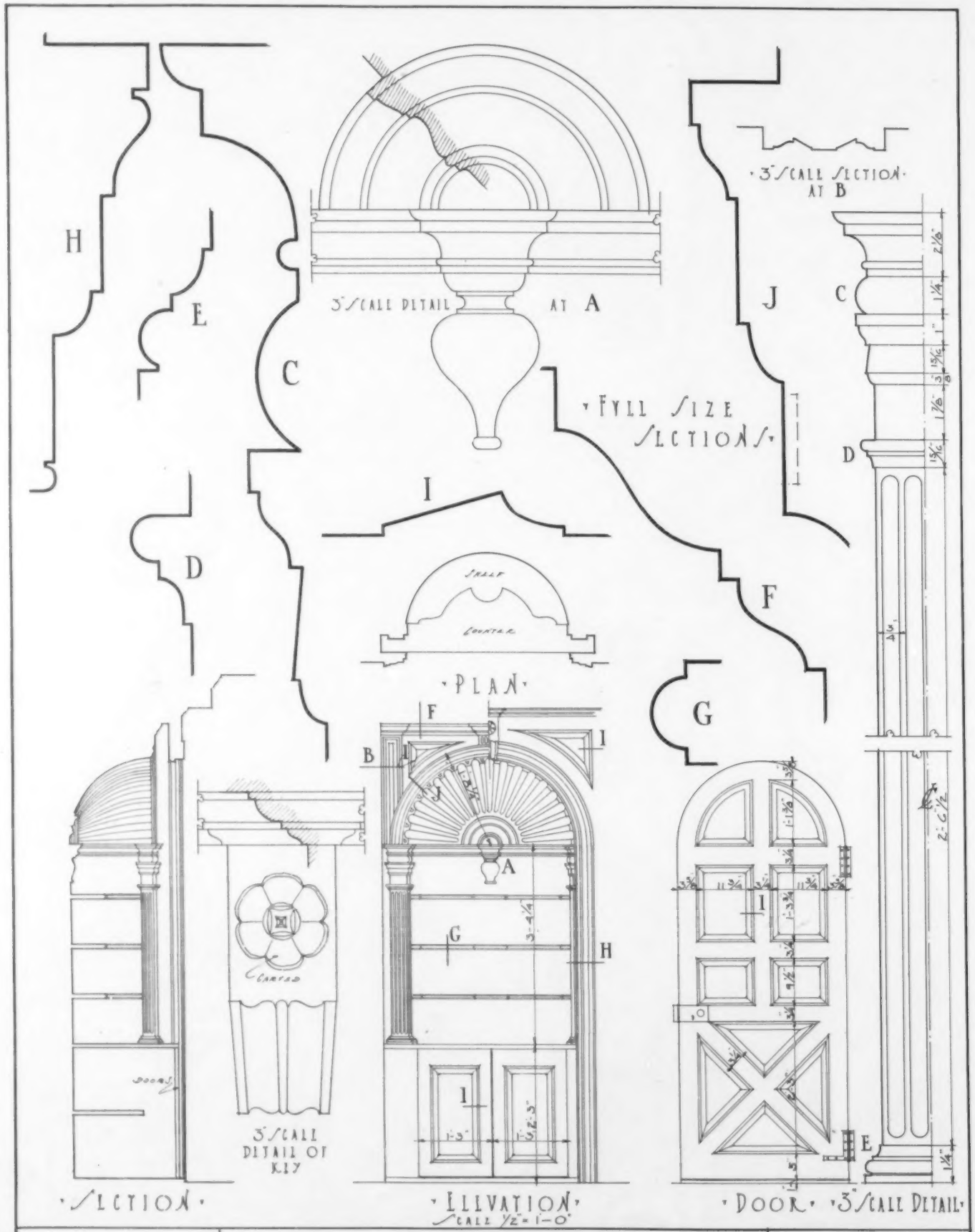


PLATE 40 MAY 1917	WEBB-WELLS HOUSE CHINA CLOSET WETHERSFIELD-CONN. BUILT 1755	MEASURED AND DRAWN BY J. FREDERICK KELLY

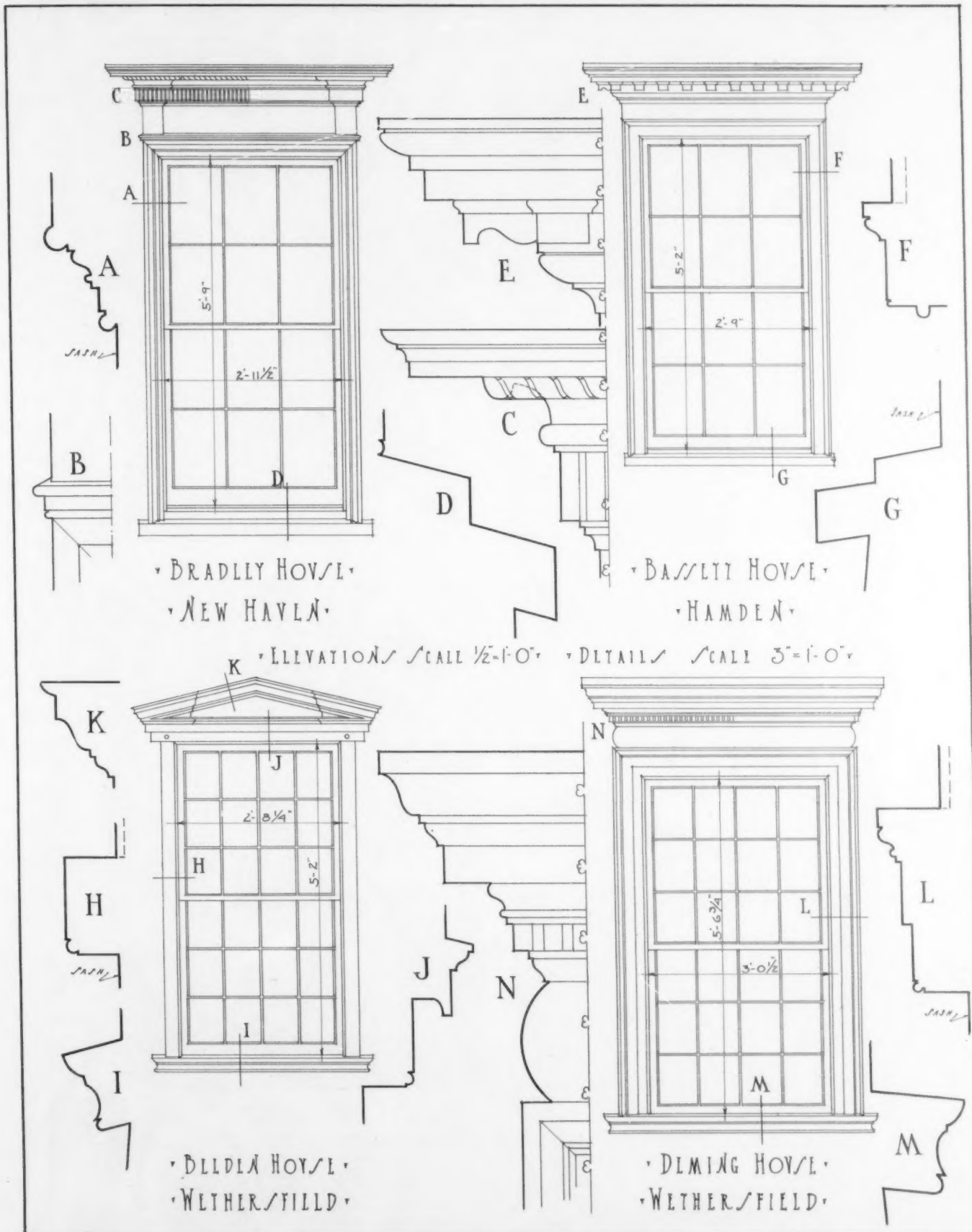
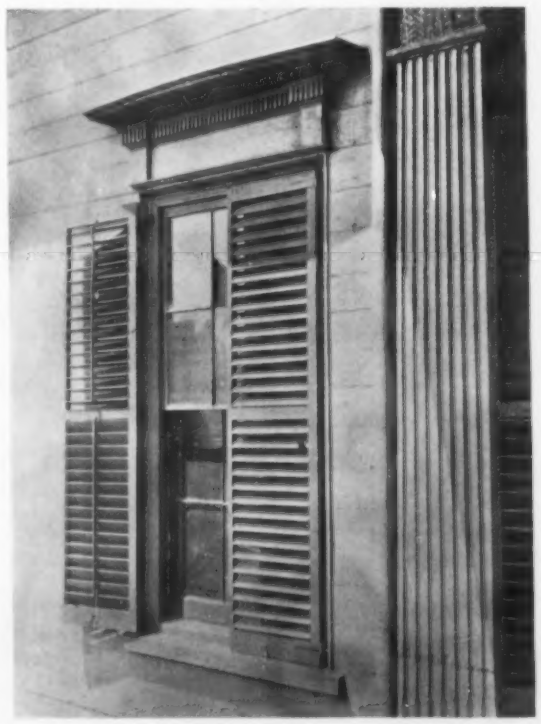


PLATE 41 MAY 1917	TYPICAL WINDOWS FROM CONNECTICUT HOUSES	MEASURED AND DRAWN BY J.FREDERICK KELLY

PLATE FORTY-ONE

FROM THE DEMING HOUSE, WETHERSFIELD

FROM THE BASSETT HOUSE, HAMDEN



FROM THE BRADLEY HOUSE, NEW HAVEN

FROM THE BELDEN HOUSE, WETHERSFIELD

THE window from the Bradley house is work of a late date. The detail and ornament of the once elaborate house is Adam — and very late Adam — in period. The rope moulding is repeated in the main cornice of the house, which is denticulated also. The exterior trim is decidedly unusual in section.

The Bassett house window, also of late date, is classic in its conception. Architrave, frieze, and cornice in regular proportion accentuate this impression. The exterior trim, or architrave, is extremely simple, but pleasing, while the double sill — as in the Bradley house window — is not common.

The window of the Belden house is the earliest of the four. Its frame of plank, fastened with wooden pins, alone indicates this. The sill section is interesting and unusual: while the breaks in the pediment are common in windows of this period and type.

The Deming house window, handsome in its proportion and detail, is somewhat similar in type to that of the Bassett house, though of earlier date. As the sill section is nearly similar to that of the Belden house window, it is quite possible that both houses were built by the same carpenter.

TYPICAL WINDOWS FROM FOUR CONNECTICUT HOUSES

MEASURED DRAWING ON PRECEDING PAGE

Private Water Supplies for Country Estates

By SAMUEL A. GREELEY

Hydraulic and Sanitary Engineer, Chicago, Ill.

THERE is a growing realization amongst architects and owners that the problem of securing an ample supply of pure and soft water at country houses and estates is one of importance requiring special study. Probably the particular reason for this feeling is the increasing knowledge of the dangers of pollution reaching wells and other sources of supply. But there is also a growing demand for soft water and for waters free from color, taste, and odor, as well as for sufficient supplies of water at ample pressure to afford adequate fire protection. At large stock farms the water supply problem is particularly important.

Such private water supplies cover a variety of conditions, from the needs of small houses of 10 or 20 persons up to the requirements of large estates having activities ranging from stock watering to laundrying. Sometimes the water supply is taken from deep wells, in which case it may be hard and unsatisfactory for washing. In other places the water may come from surface storage, in which case it may be subject to pollution and require filtering. A number of interesting special problems along this line which have been called to the writer's attention for solution are briefly summarized herewith.

QUANTITY. The first point to fix in planning a water supply is the quantity of water required. The actual needs of a single person can be amply met by an average daily allowance of 30 gallons of water. However, this water will not be used uniformly throughout the 24 hours, and will be subject to loss through leakage during its delivery from the original source to the point of use. Therefore, a more liberal per capita allowance is usual. In some instances records indicate that 50 gallons per capita is a sufficient allowance. However, it is wiser to develop a supply of 100 gallons per capita as a minimum, with reserve storage to meet higher rates for short periods. An additional quantity of water must be provided for the laundry. A number of gaugings indicate the average daily requirements for laundry purposes to be about 10 gallons per capita. For stock farms, surprisingly large quantities are needed. It is estimated that stock will drink the following amounts of water daily :

Cows	10 to 15 gallons
Horses	10 to 12 gallons
Sheep	0.5 to 1.5 gallons
Hogs	0.5 to 2.0 gallons

In addition to the water actually needed for drinking, a supply must be provided for washing the barns. Gaugings at stock farms indicate a consumption for all farm purposes of 25 gallons per head of stock per day.

Finally, provision must be made in the supply for sprinkling gardens and barns and for fire protection. These two uses must be estimated for each particular case, guided by experience elsewhere. Usually the fire protection element must be partly covered by the stored water. For a stock farm having an area of 1 square mile and 100 head of cattle with an estimated population of 50 persons, the writer developed a water supply on the basis of 7,000 gallons per 24 hours. The estimated rate of consumption of this water through the 24 hours is shown in Fig. 1. Fire protection was provided in two storage reservoirs, having a combined capacity of 14,000 gallons.

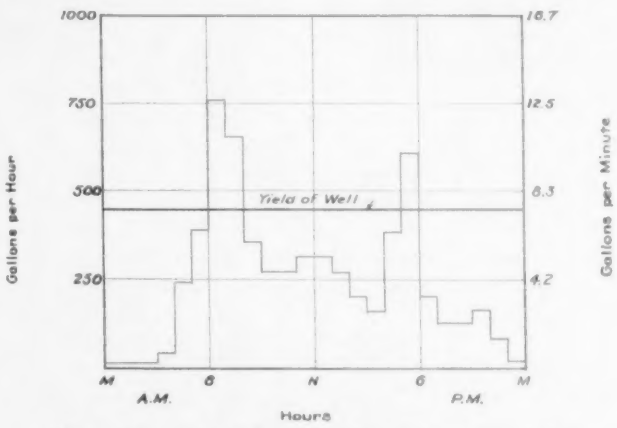


Fig. 1. Diagram showing estimated daily rate of water consumption for stock farm having 100 head of cattle

QUALITY OF WATER. Water which falls as rain is practically distilled water, is soft and pure, colorless and tasteless. Some of this water flows over the surface of the ground into streams and lakes, and in so doing takes up in solution or suspension more or less foreign substances. From some surfaces the water is colored, from others, mineral salts are added which make the water hard. All surface waters may take up harmful disease, producing bacteria. When water is stored in ponds or lakes, organisms grow which may impart to it a decidedly unpleasant taste or odor. Such organisms are the minute algæ, crustacea, diatoms, and the like. Surface waters must usually be suspected, and the consumers must be protected by treatment of the water or by safeguarding the source.

DEVELOPMENT OF WATER SUPPLY. From the estimated quantity of water required and from investigations of the available sources, the works for the water supply can be planned. Usually a comprehensive plan should be prepared to meet all reasonable future requirements. The works can, however, be developed progressively from this plan as the actual present needs justify. A frequent trouble is the installation of too small distribution pipes. These serve satisfactorily for a few years, but as the use for water increases, or plumbing fixtures begin to leak, or because of sudden large demands during fires, the mains are found to be inadequate. It is frequently found that the actual quantity of water developed is excessive, while the mains to distribute and the plants to treat the water are inadequate. It is desirable to procure a proper balance between these two elements. The safe construc-

tion of dams, the proper size and placing of wells, the selection of economical pumping machinery and such technical matters, all determine the efficiency of the operation of the water supply which, of course, is the final test. In one instance coming to my attention, the pumps were driven by belt connected engines. The loss of power in the belts was so great as to warrant the installation of entirely new direct connected equipment. Troubles from frozen and air bound pipes must also be prevented.

Shallow wells in particular are subject to surface pollution and are not a safe source of water for domestic consumption. The following quotation is from the Tenth Annual Report of the Chemical Division of the Indiana State Board of Health for the year ending Sept. 30, 1915: "Of the 9,030 well supplies (in Indiana) 3,891 are derived from so-called deep wells and 5,139 from dug or shallow driven wells. Records of the laboratory show (10,957 samples) that 17.8 per cent of all deep wells and 58.4 per cent of all shallow wells are unsatisfactory as water supplies."

The water which does not run off as surface water percolates into the soil and reappears as well water. In percolating through the soils these ground waters take up substances, usually by solution, which often make the water hard. Sometimes this hardness adds a pleasant taste to the water or a medicinal quality. In other instances the water is hardened and made unsatisfactory for washing. Thus the quality of the water may be predicted after an examination of the available sources.

Treatment of Water. To remove from the water various foreign substances taken up by it, after it reaches the earth as rain, some special method of treatment must be applied. Thus turbid and polluted waters must be filtered and hard waters softened. It is sometimes thought that household filters are an ample protection against bacterial pollution. In this connection it is interesting to summarize the investigation of the efficiency of household filters made by the chemists of the Sanitary District of Chicago. They tested twelve different types of household filters, operating on Lake Michigan water, and as a conclusion state "that small amounts of turbidity are removed satisfactorily, but that the bacterial efficiency cannot always be depended upon."

Removal of Color. In some country districts the only available sources of water are surface supplies from swampy regions, which at times produce colored water. The color of water can be removed largely in connection with filters by coagulating the water with minute quantities of alum. In some instances clarification can be accomplished by agitating the water with sufficient quantities of finely divided clay. This method is a well known household remedy. Thus drinking water for farms has been clarified by shaking with clay in large bottles and allowing the clay to settle out. A modern explanation of this action is that the coloring matter in water is due to particles in the colloidal state, which are merely minute

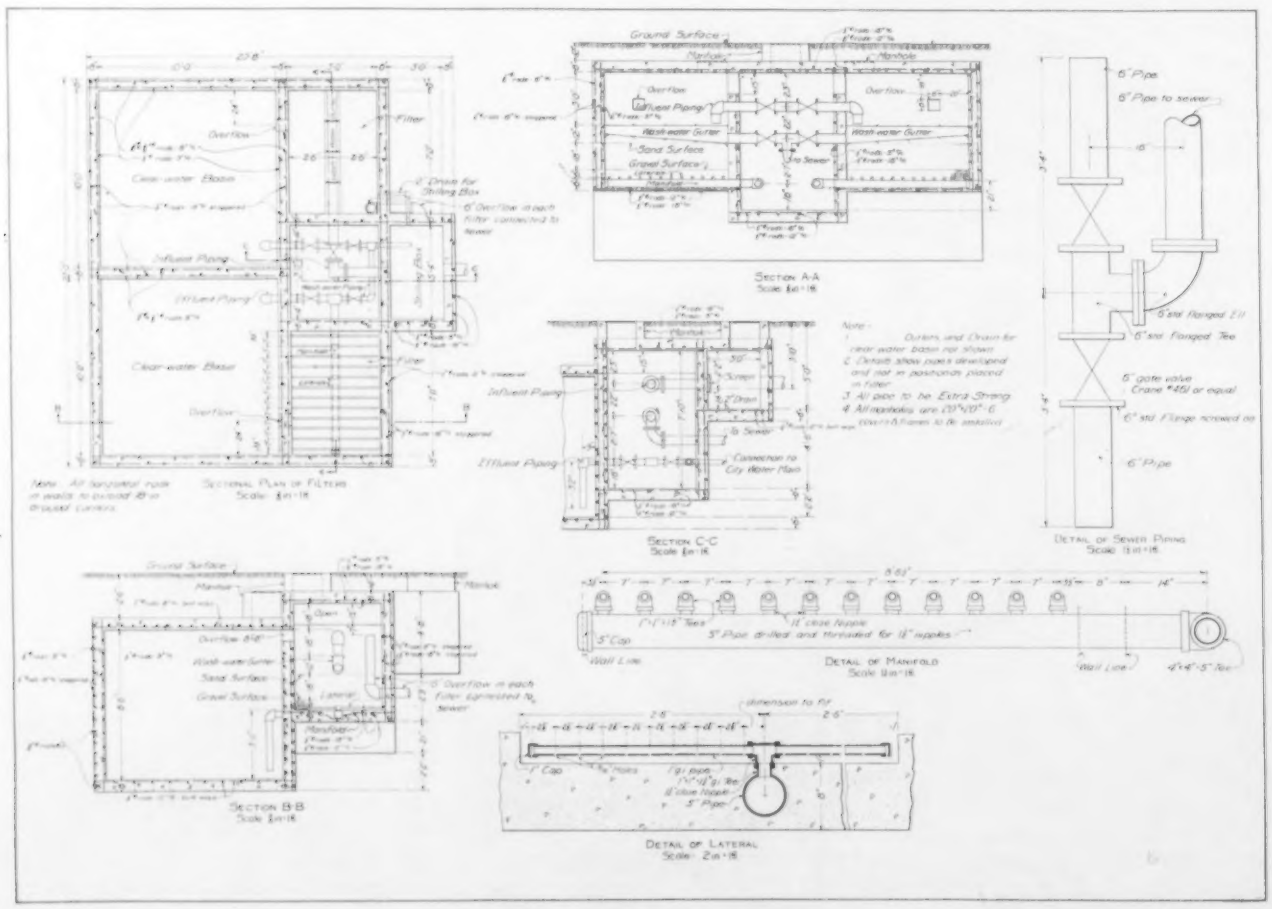


Fig. 2. Details of soft water filter plant

particles in suspension. They are, as it were, swept out of the water by the finely divided clay or alum added to the water. Examinations and tests of each water are needed to determine the actual treatment in each case.

Waters of this character also usually contain considerable amounts of organic matter which render the water difficult to use in boilers because of foaming. This objectionable quality of the water is also modified by treatment with alum.

Removal of Tastes and Odors. Waters having tastes and odors due to excessive growths of microscopic organisms or to special foreign substances may frequently be much improved in quality by simple aeration. This can be accomplished by cascading the water over concrete steps so that it falls in fine drops. If sufficient fall is available, the water may be sprayed through a special nozzle from one basin to another at a lower elevation. The amount and character of aeration must be determined for each particular case.

Developing Soft Water. One of the characteristics most frequently sought for in the private water supplies is softness; that is, freedom from hard mineral constituents such as the salts of lime, magnesium, and iron. These salts make the water undesirable for washing and for use in boilers. They reduce the capacity of pipes by incrustation. The salts of iron stain articles with which they come in contact. The hard waters are usually those from deep wells. Hard waters can be softened by treating the water with lime or soda or both in small quantities, coupled with sedimentation and filtration. Plants in small units for easy operation can be designed.

A somewhat simpler method of softening certain hard waters is by the use of some zeolite. A zeolite is a mineral which has the power of exchanging its base for that of another salt. Artificial zeolites are prepared for such use, usually as a form of hydrated sodium silicate. When hard water is passed through this compound, the lime and magnesium in the water are taken up in exchange for the sodium of the zeolite. Sodium (or salt) does not harden the water and is not present in sufficient quantities to affect the taste.

A preferable means of developing a soft water is by storing rain water in sufficient quantities to tide over dry seasons of little rainfall. Frequently water from roofs and yards can be collected and stored in a cistern of sufficient capacity to provide a moderate supply at all times. Under other conditions small streams can be dammed up to provide sufficient storage. In such cases it is necessary to filter the water before using it in order to remove the dirt washed off the roofs, yards, and fields. Such a filter built for a residence in Lake Forest, Ill., is shown in Fig. 2. Unfortunately a photographic illustration cannot be shown, as the whole filter is set underground. A small area of filter is possible because of the provision for washing the sand at frequent intervals, thus maintaining an effective filtration volume.

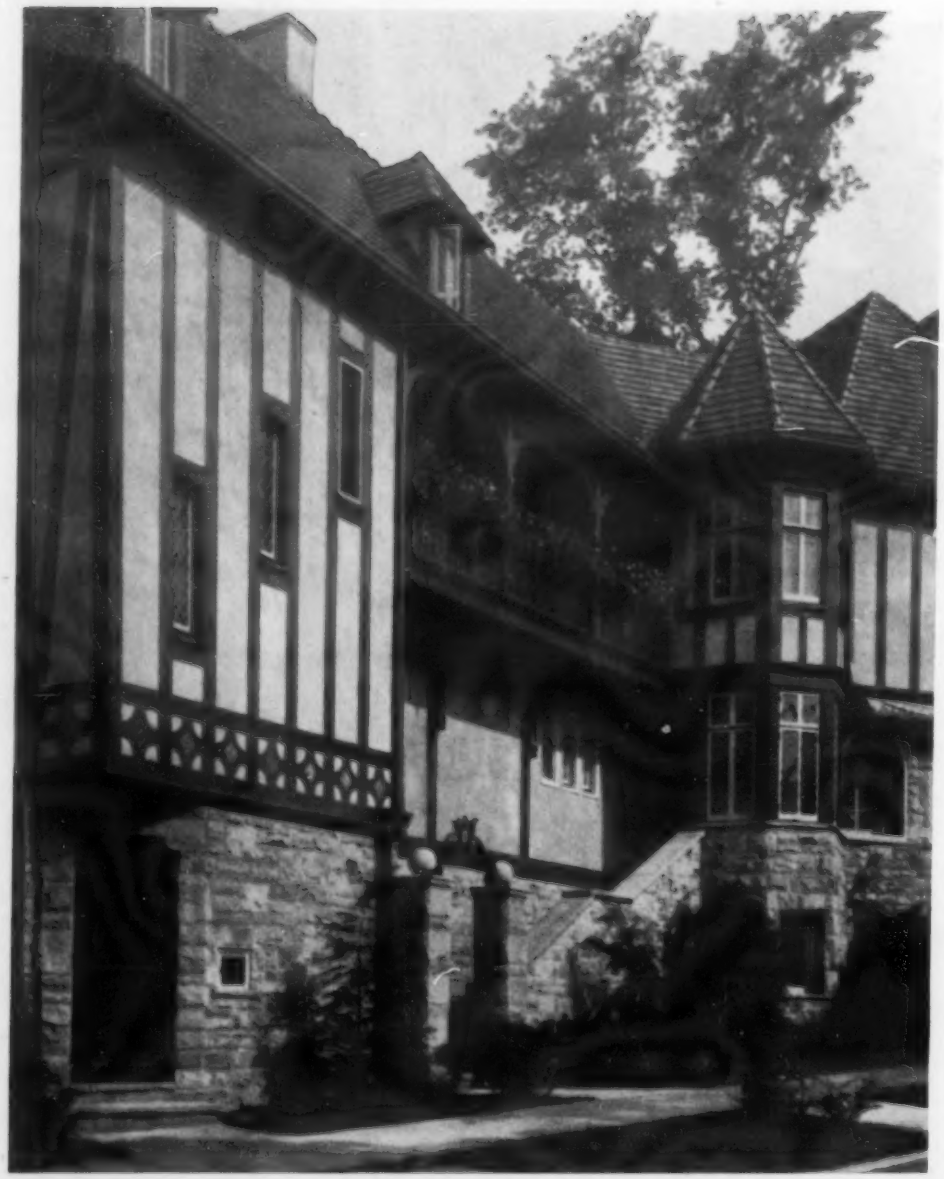
At a country estate near Pottstown, Pa., the water supply was taken from deep wells and pumped to an elevated tank in a water tower attractively designed of brick and field stones. Below the storage tank, provision was made for a zeolite softening apparatus housed in the tower.

An interesting feature of the use of hard waters relates to their effect on the disposal of sewage. In one instance brought to the attention of the writer for correction, decided odors resulted from the sewage treatment plant. The decomposition of the sewage, which was not properly controlled, produced hydrogen sulphide from the sulphates in the water, with the consequent objectionable nuisances. Sewage disposal requires special attention where hard waters are used.

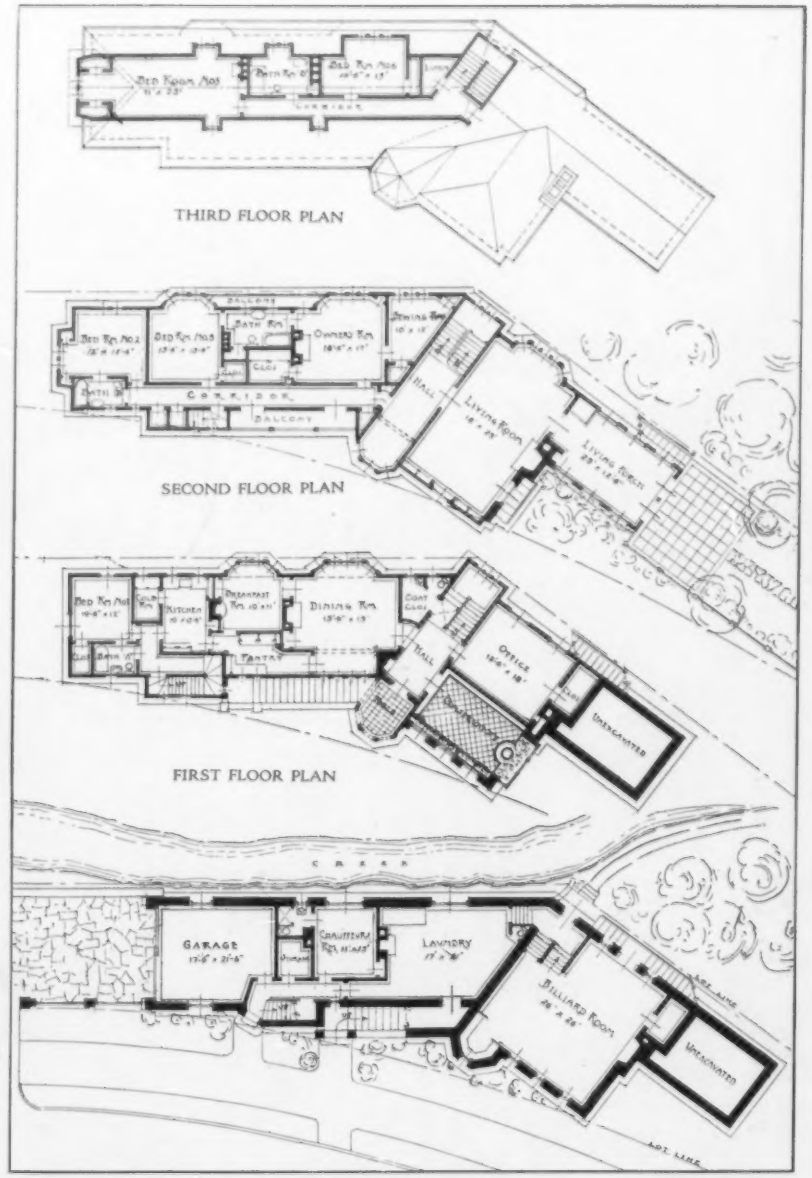
Water Filtration. The most useful form of plant for treating water is a filtration plant, because of its wide range of application. In some favorable localities existing sand beds can be used as filters by the construction of proper infiltration galleries. These infiltration galleries collect the water as it filters through the sand from some adjacent pond or river. They are in effect large well points built of masonry and set horizontally. Special filters can also be built for treating the water. Two types are used,—one is the so-called rapid sand filter and the other the slow sand filter.

A slow sand filter is a bed of sand of proper size and construction about 3 feet deep. The water is distributed over the surface and collected in proper underdrains below. Water can be filtered at the rate of about 3,000,000 gallons in 24 hours per acre of filter. Where there is not sufficient area for this type of filter, the rate of filtration can be largely increased by applying small quantities of alum or sulphate of iron to the water. Standard apparatus of tried worth is available for applying the chemicals and controlling the various parts of the filter. At many large country estates filter plants of this type have been installed for treating the general water supply.

Location of Wells. Where well waters are to be used, and in particular shallow wells, special care should be exercised in the location of the well, especially with reference to the location of cesspools or sewage disposal plants. At Huron Mountain, Mich., the water supply was taken from well points driven 3 to 5 feet into the sandy bottom of a lake. The sewage from a number of cottages emptied into cesspools. These cesspools were located at distances varying from 12 to 50 feet from the bank of the stream discharging into the lake, from whose sandy bottom the wells were supplied. A considerable number of cases of intestinal disease pointed to the water supply as being subject to pollution from the cesspools.

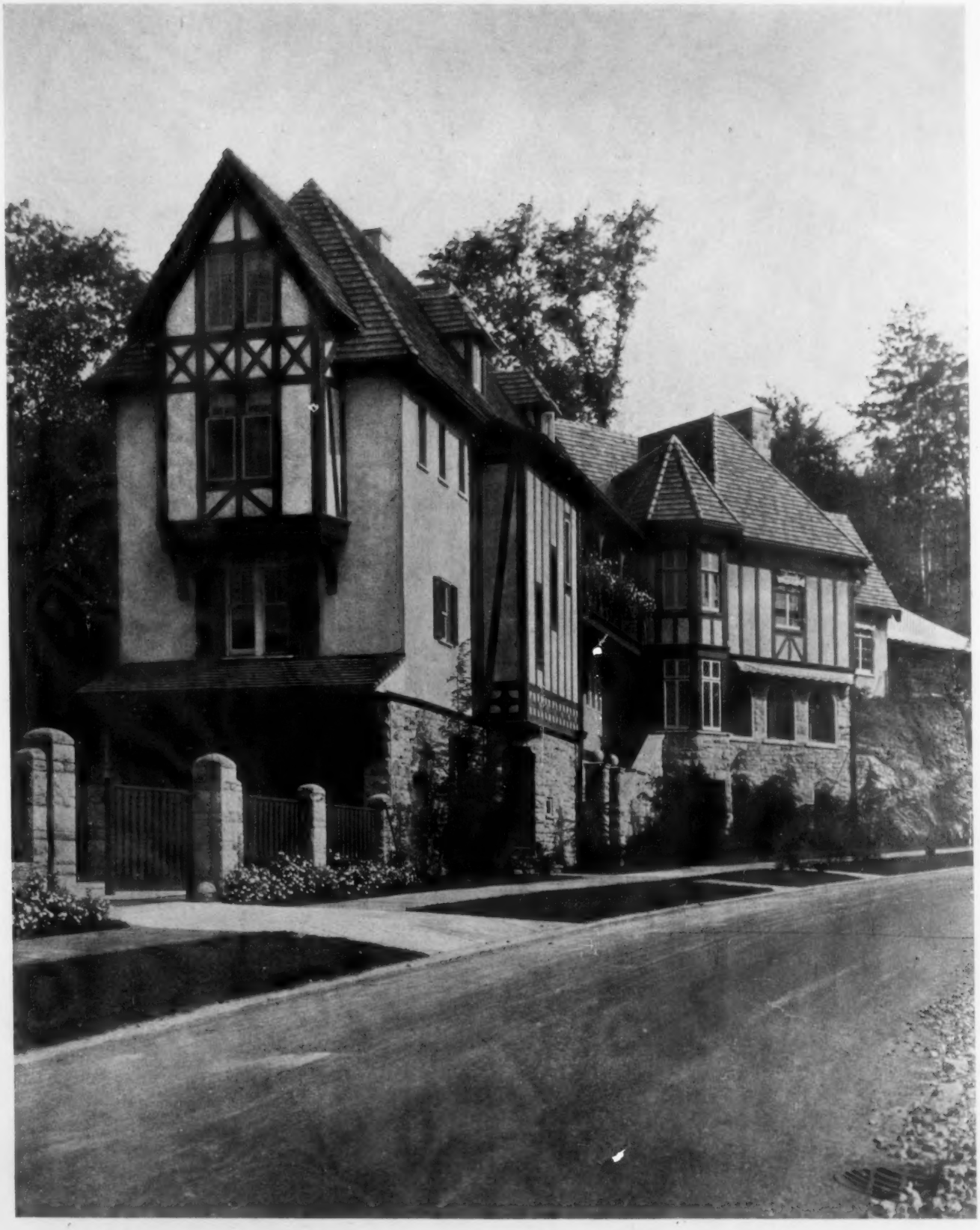


DETAIL OF ENTRANCE FRONT



HOUSE OF B. R. DEMING, ESQ., CLEVELAND, OHIO

HOWELL & THOMAS, ARCHITECTS



HOUSE OF B. R. DEMING, ESQ., CLEVELAND, OHIO
HOWELL & THOMAS, ARCHITECTS

DINING ROOM

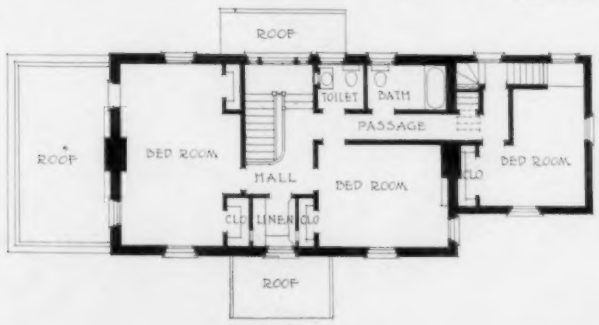
BREAKFAST ROOM

ENTRANCE HALL

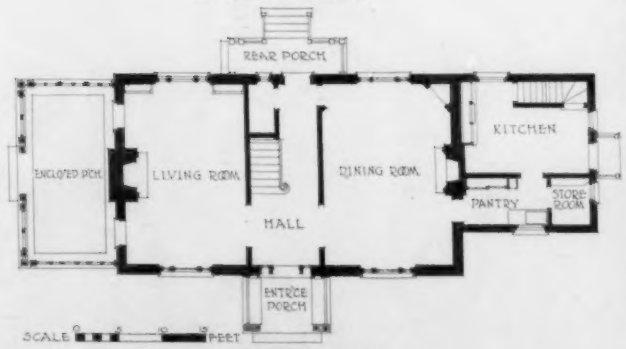
HOUSE OF B R. DEMING, ESQ., CLEVELAND, OHIO

HOWELL & THOMAS, ARCHITECTS

GENERAL VIEW FROM STREET



SECOND FLOOR PLAN



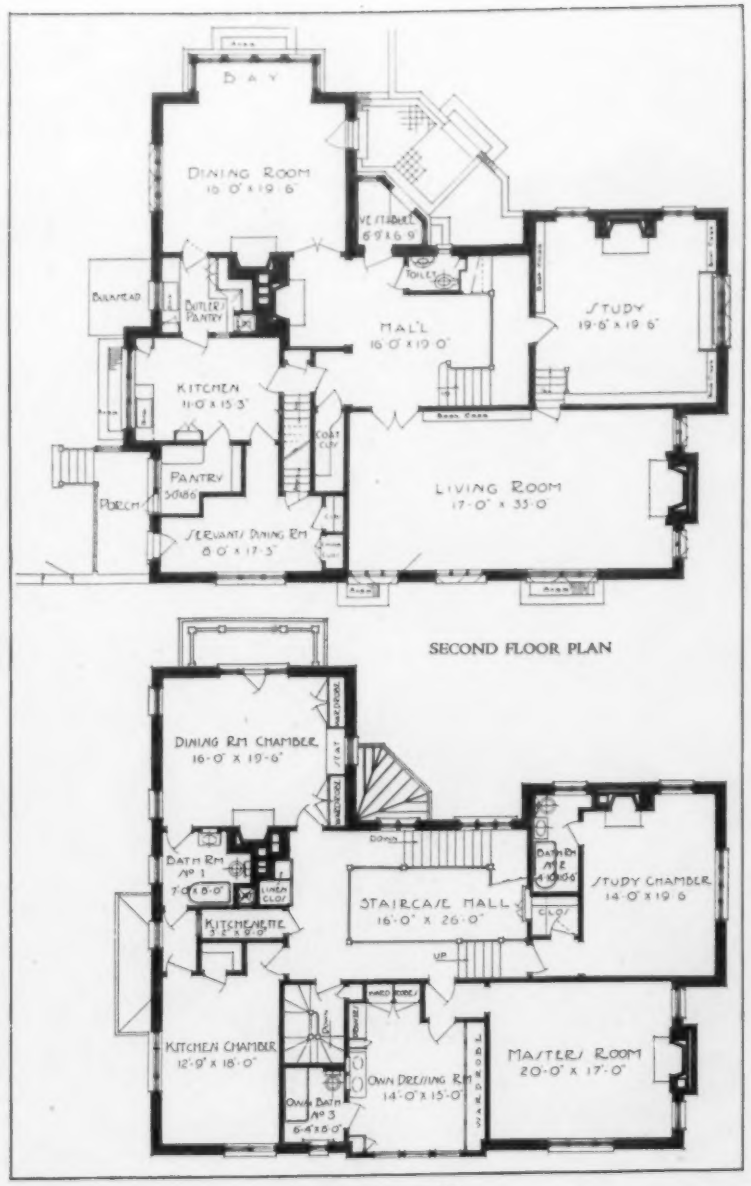
FIRST FLOOR PLAN

DETAIL OF PORCH

HOUSE OF R. E. ACTON, ESQ., ROSEMONT, VA.

DONN & DEMING, ARCHITECTS

DETAIL OF ENTRANCE



FIRST FLOOR PLAN

HOUSE OF PROF. A. M. TOZZER, CAMBRIDGE, MASS.

KILHAM & HOPKINS, ARCHITECTS

ENTRANCE FRONT

GARDEN FRONT FROM STREET

HOUSE OF PROF. A. M. TOZZER, CAMBRIDGE, MASS.

KILHAM & HOPKINS, ARCHITECTS

VIEW OF FIRST FLOOR HALL

SECOND FLOOR HALL

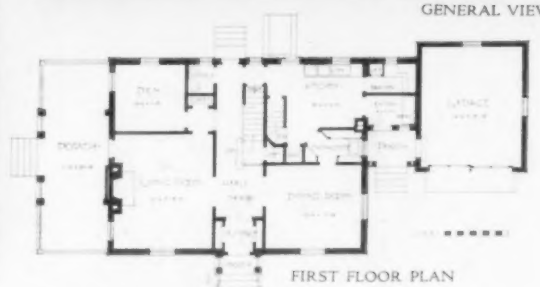
FIREPLACE IN HALL

HOUSE OF PROF. A. M. TOZZER, CAMBRIDGE, MASS.

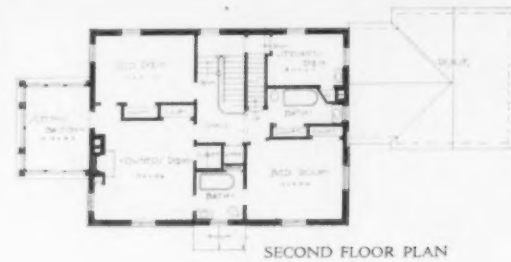
KILHAM & HOPKINS, ARCHITECTS

DETAIL OF DOORWAY

GENERAL VIEW FROM STREET



FIRST FLOOR PLAN

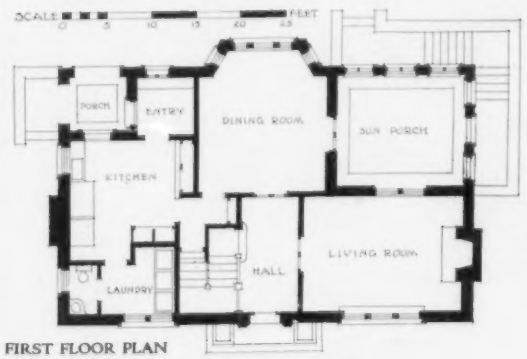


SECOND FLOOR PLAN

HOUSE AT BRAINTREE, MASS.

COOLIDGE & CARLSON, ARCHITECTS

DETAIL OF DOORWAY



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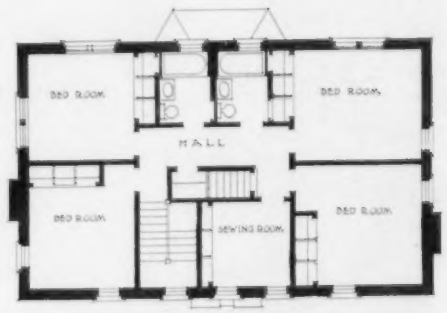
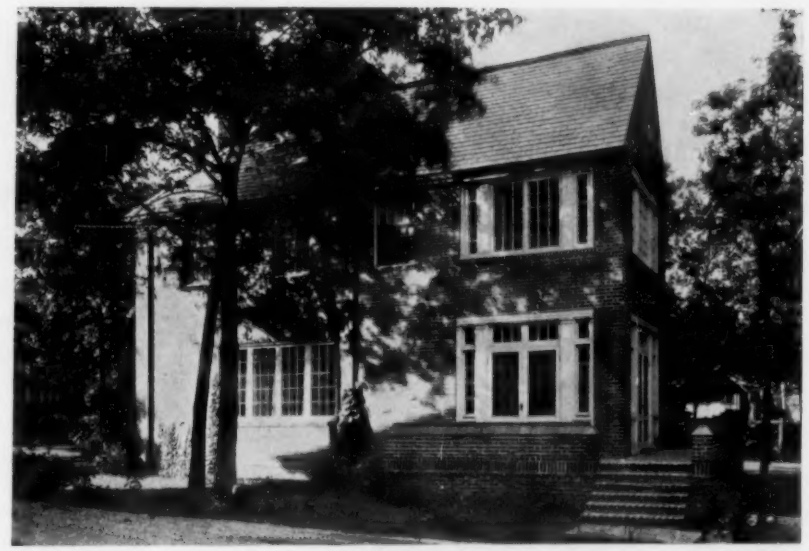


SECOND FLOOR PLAN

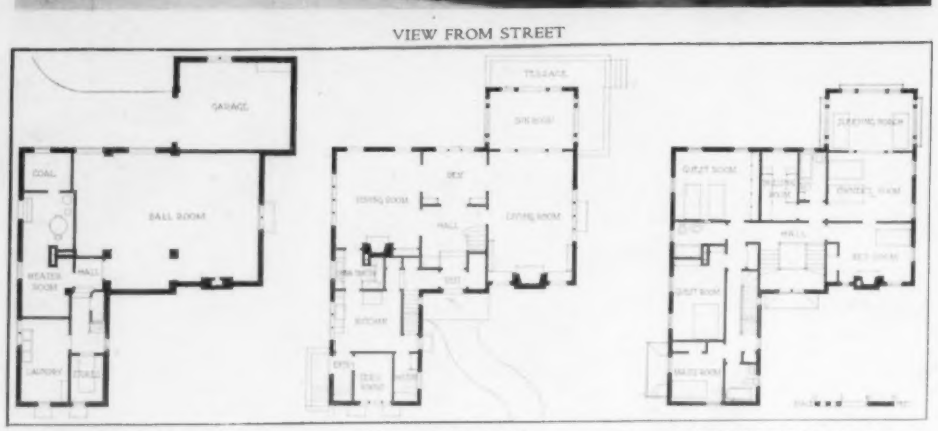
HOUSE OF CHARLES OTTO, ESQ., SCARSDALE, N. Y.

TOOKER & MARSH, ARCHITECTS

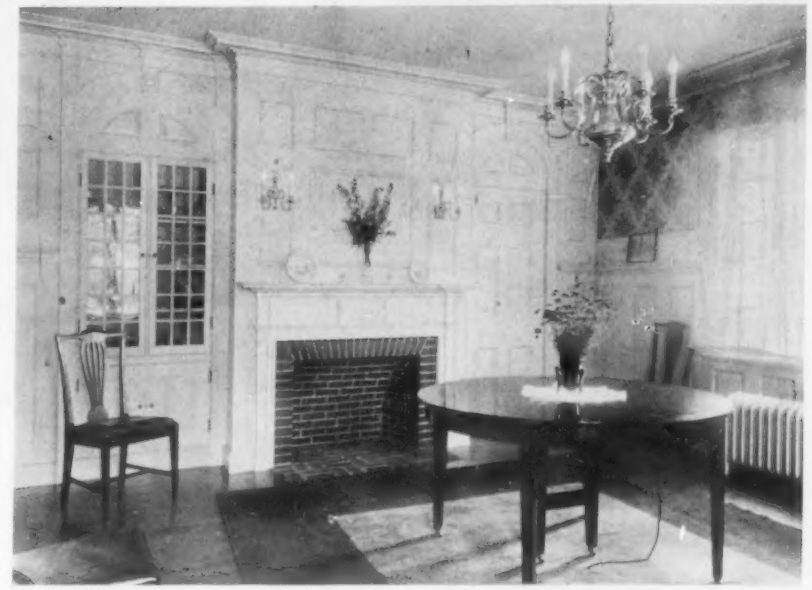
VIEW FROM STREET



VIEW FROM SIDE



BASEMENT FLOOR PLAN FIRST FLOOR PLAN SECOND FLOOR PLAN



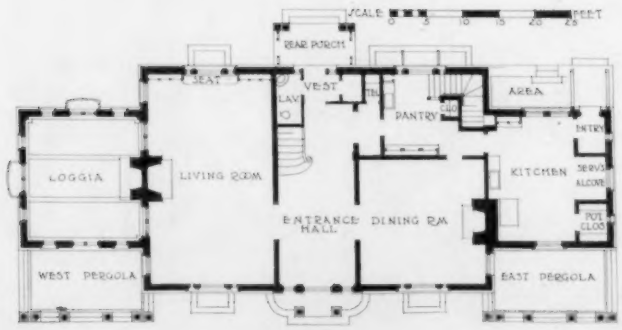
DINING ROOM

HOUSE OF M. E. GRUSH, ESQ., WINCHESTER, MASS.

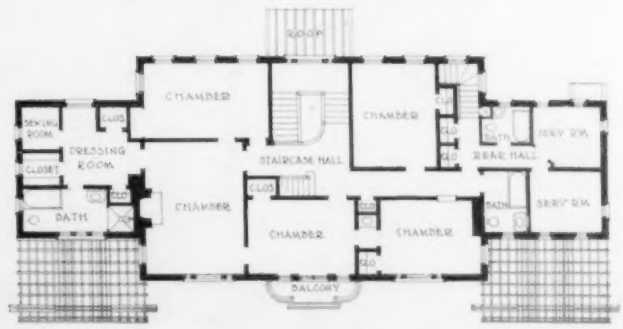
DAVID WITMER, ARCHITECT

HOUSE OF MAJOR JOHN M. FRAZIER, ST. JOSEPH, MO.

ECKEL & ALDRICH, ARCHITECTS



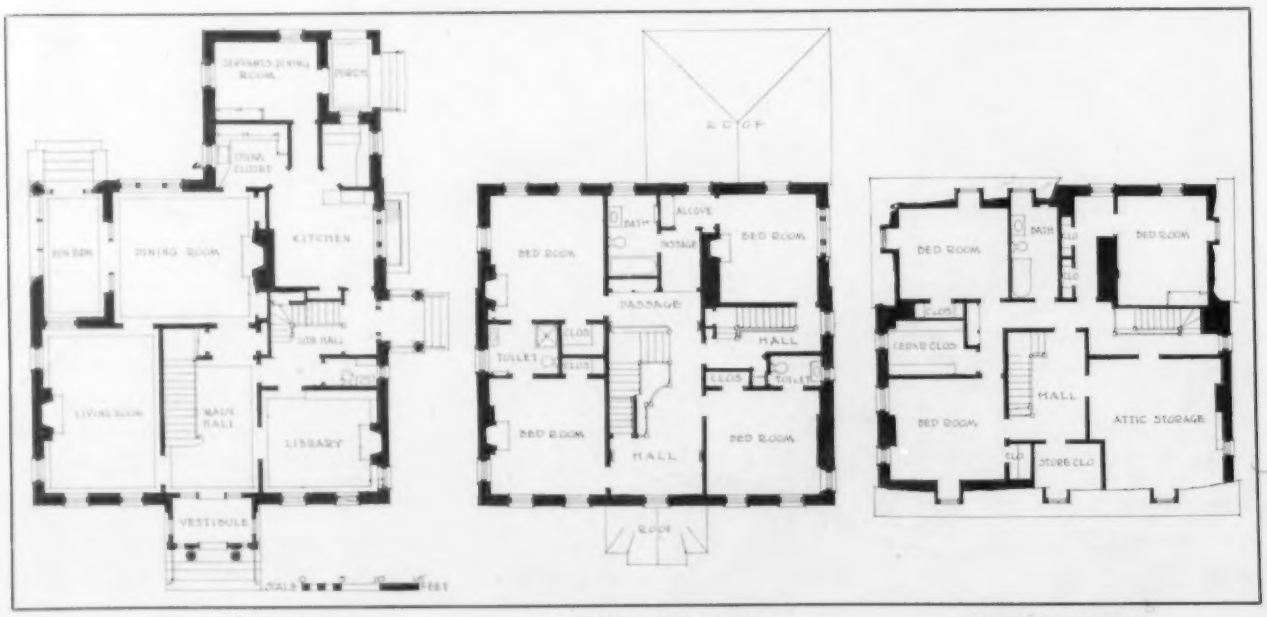
FIRST FLOOR PLAN



SECOND FLOOR PLAN

HOUSE OF E. IRVING HANSON, ESQ., NEW ROCHELLE, N. Y.

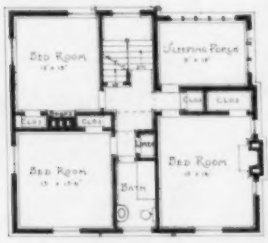
LUDWIG LINDENMEYER, ARCHITECT



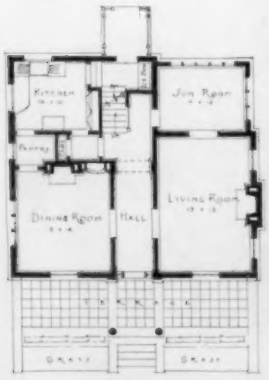
FIRST FLOOR PLAN SECOND FLOOR PLAN THIRD FLOOR PLAN

HOUSE OF HENRY BATCHELDER, ESQ., SALEM, MASS.

LITTLE & BROWNE, ARCHITECTS



SECOND FLOOR PLAN



FIRST FLOOR PLAN

DINING ROOM

HOUSE OF A. B. McCLURE, ESQ., COLUMBUS, OHIO

HOWELL & THOMAS, ARCHITECTS

GENERAL VIEW FROM PORCH SIDE

VIEW FROM STREET

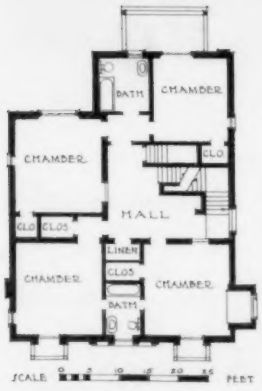
SECOND FLOOR PLAN

FIRST FLOOR PLAN

HOUSE OF F. B. EISEMAN, ESQ., ST. LOUIS, MO.

LaBEAUME & KLEIN, ARCHITECTS

GENERAL VIEW FROM STREET



SECOND FLOOR PLAN

FIRST FLOOR PLAN

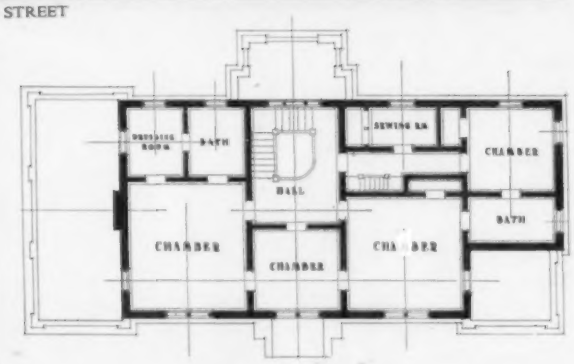
END OF LIVING ROOM

HOUSE AT EVANSVILLE, IND.

F. MANSON GILBERT, ARCHITECT AND OWNER

GENERAL VIEW FROM STREET

DETAIL OF DOORWAY



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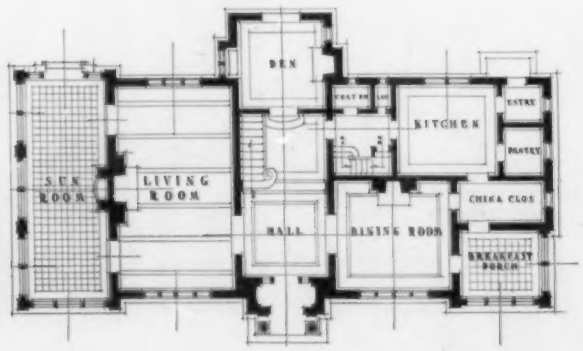
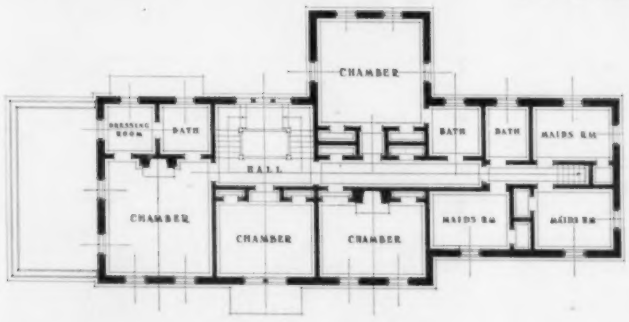


FIRST FLOOR PLAN

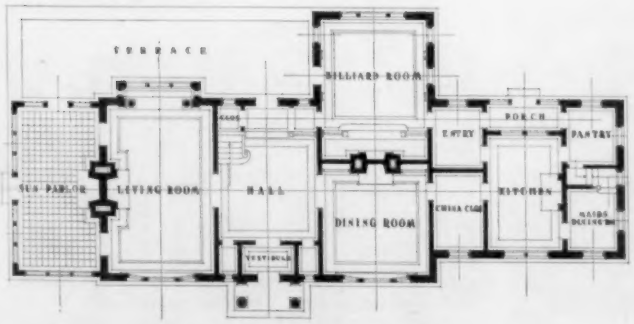
HOUSE OF MRS. E. J. ABBOTT, NEWTON, MASS.

JAMES PURDON, ARCHITECT

GENERAL VIEW OF FRONT



SECOND FLOOR PLAN



FIRST FLOOR PLAN

DETAIL OF DOORWAY

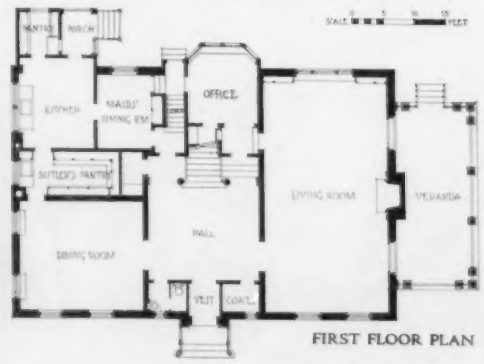
HOUSE OF A. E. THAYER, ESQ., DEDHAM, MASS.

JAMES PURDON, ARCHITECT

GENERAL VIEW FROM STREET

DETAIL OF DOORWAY

STAIRWAY



FIRST FLOOR PLAN

HOUSE OF FRANK KUHN, ESQ., DETROIT, MICH.

ALBERT KAHN, ARCHITECT; ERNEST WILBY, ASSOCIATE

GENERAL VIEW FROM STREET

SECOND FLOOR PLAN

FIRST FLOOR PLAN

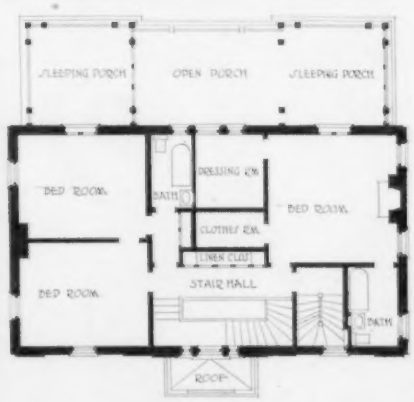
DETAIL OF DOORWAY

HOUSE OF C. J. BUTLER, ESQ., DETROIT, MICH.

ALBERT KAHN, ARCHITECT; ERNEST WILBY, ASSOCIATE

GENERAL VIEW FROM STREET

DETAIL OF ENTRANCE



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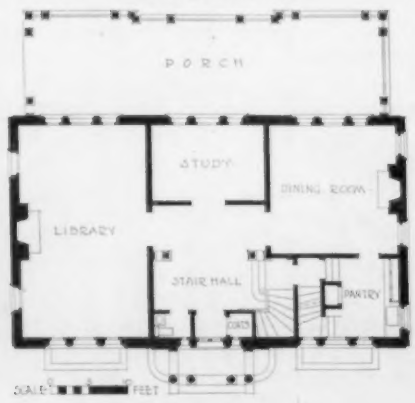
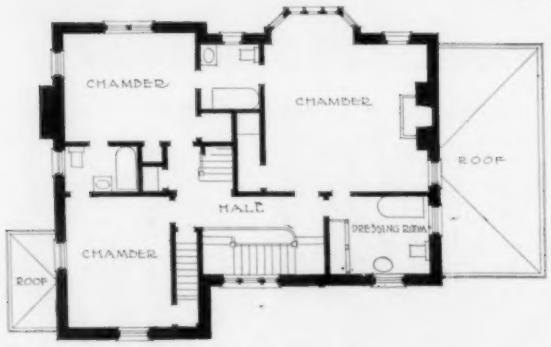


FIRST FLOOR PLAN

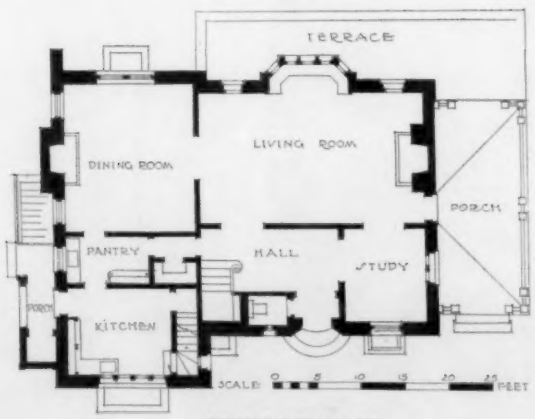
HOUSE OF DR. GORDON WILSON, GUILFORD, BALTIMORE COUNTY, MD.

LAURENCE HALL FOWLER, ARCHITECT

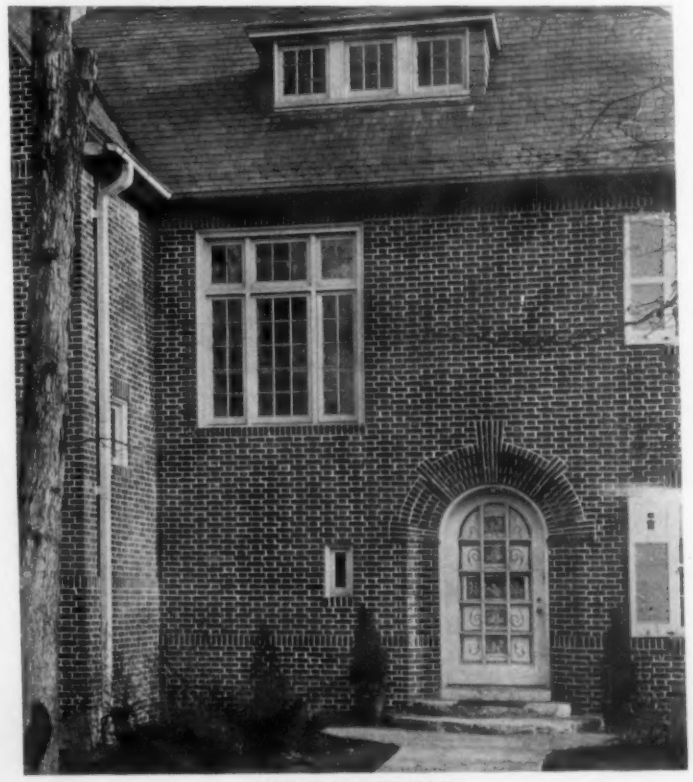
GENERAL VIEW FROM STREET



SECOND FLOOR PLAN



FIRST FLOOR PLAN

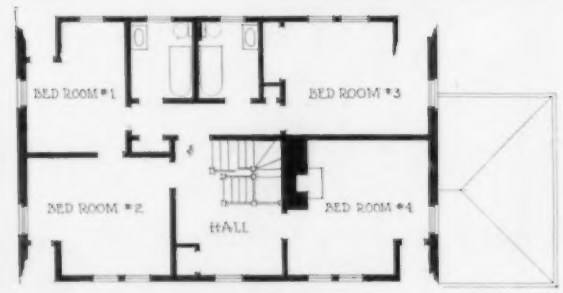


DETAIL OF ENTRANCE

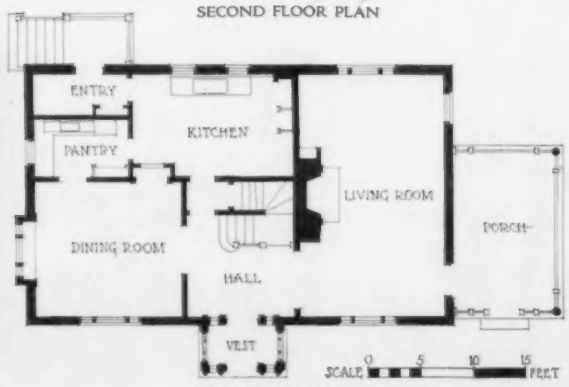
HOUSE OF W. GRAHAM BOWDOIN, ESQ., GUILFORD, BALTIMORE COUNTY, MD.

EDWARD L. PALMER, JR., ARCHITECT

DETAIL OF ENTRANCE



SECOND FLOOR PLAN



FIRST FLOOR PLAN

HOUSE OF MISS NANCY S. HOOPER, BROOKLINE, MASS.

KILHAM & HOPKINS, ARCHITECTS

SECOND FLOOR PLAN

FIRST FLOOR PLAN

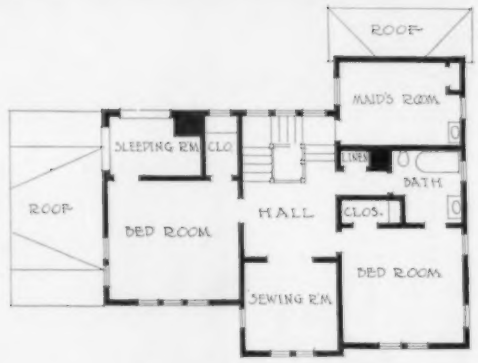
LIVING ROOM

HOUSE OF JUDGE HAUSE, WEST CHESTER, PA.

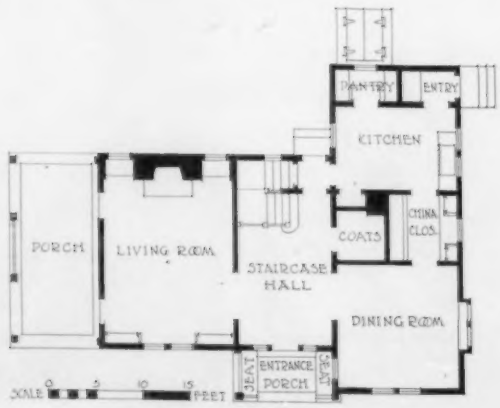
DUHRING, OKIE & ZEIGLER, ARCHITECTS

GENERAL VIEW FROM STREET

DETAIL OF PORCH



SECOND FLOOR PLAN



FIRST FLOOR PLAN

HOUSE OF MRS. ALICE J. MELCHER, NEWTON CENTER, MASS.

FRANK CHOUTEAU BROWN, ARCHITECT

GENERAL VIEW FROM STREET

SECOND FLOOR PLAN

FIRST FLOOR PLAN

DETAIL OF ENTRANCE

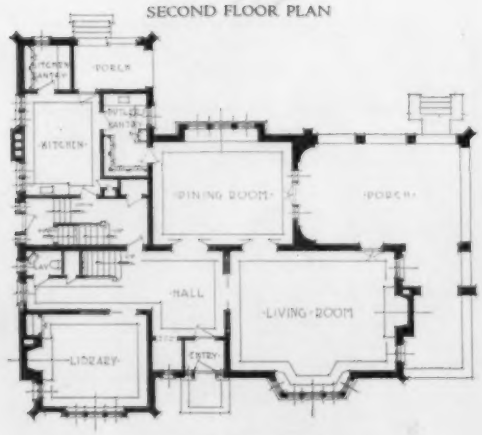
HOUSE OF E. N. SAUNDERS, ESQ., ST. PAUL, MINN.

A. H. STEM, ARCHITECT; B. W. DAY, ASSOCIATE

GENERAL VIEW FROM STREET

DETAIL OF PORCH

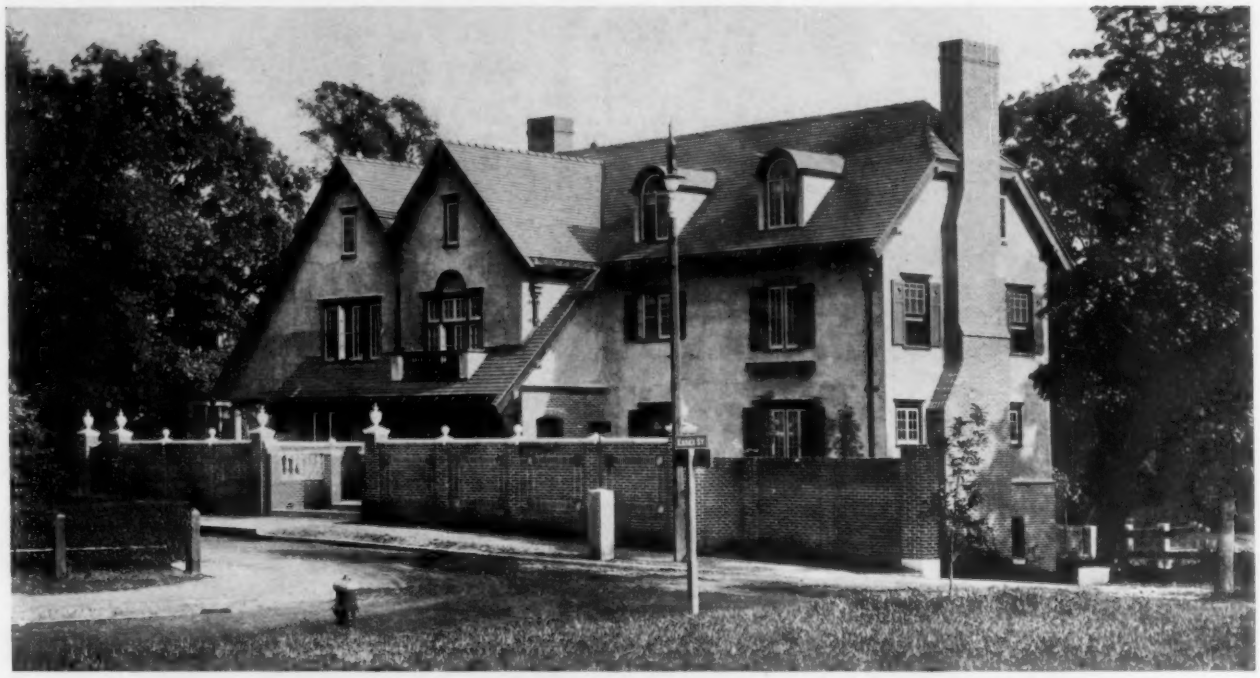
SECOND FLOOR PLAN



FIRST FLOOR PLAN

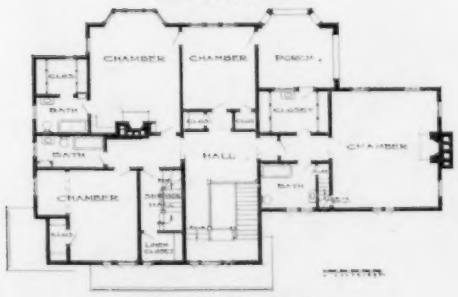
HOUSE OF A. STEARN, ESQ., CLEVELAND, OHIO

FRANK B. MEADE AND JAMES HAMILTON, ARCHITECTS



GENERAL VIEW FROM STREET

THIRD FLOOR PLAN



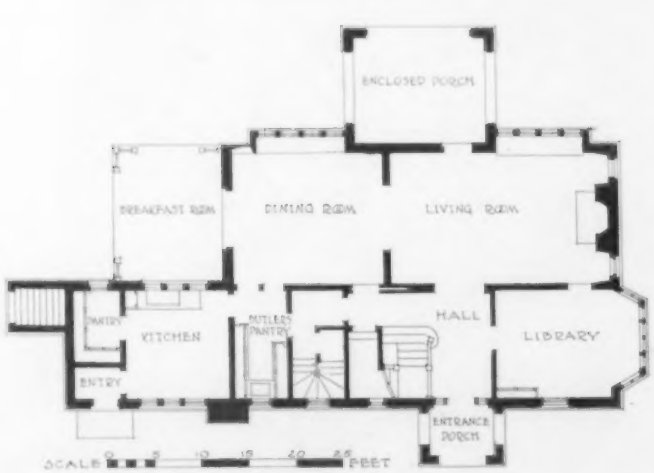
SECOND FLOOR PLAN

FIRST FLOOR PLAN

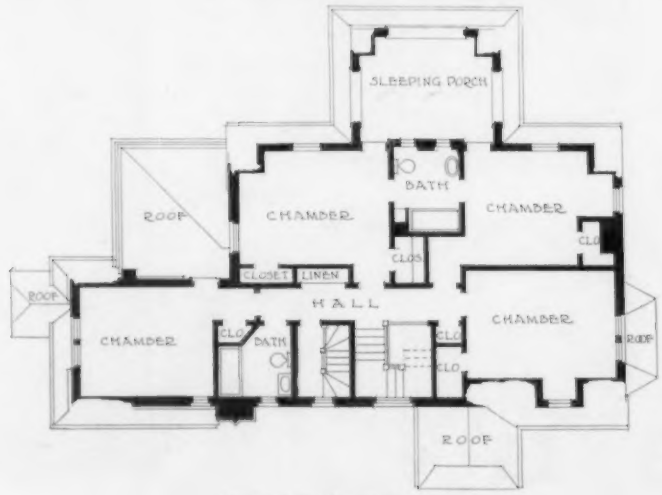
DETAIL OF ENTRANCE

HOUSE OF RENTON WHIDDEN, ESQ., BROOKLINE, MASS.

ARTHUR H. BOWDITCH, ARCHITECT



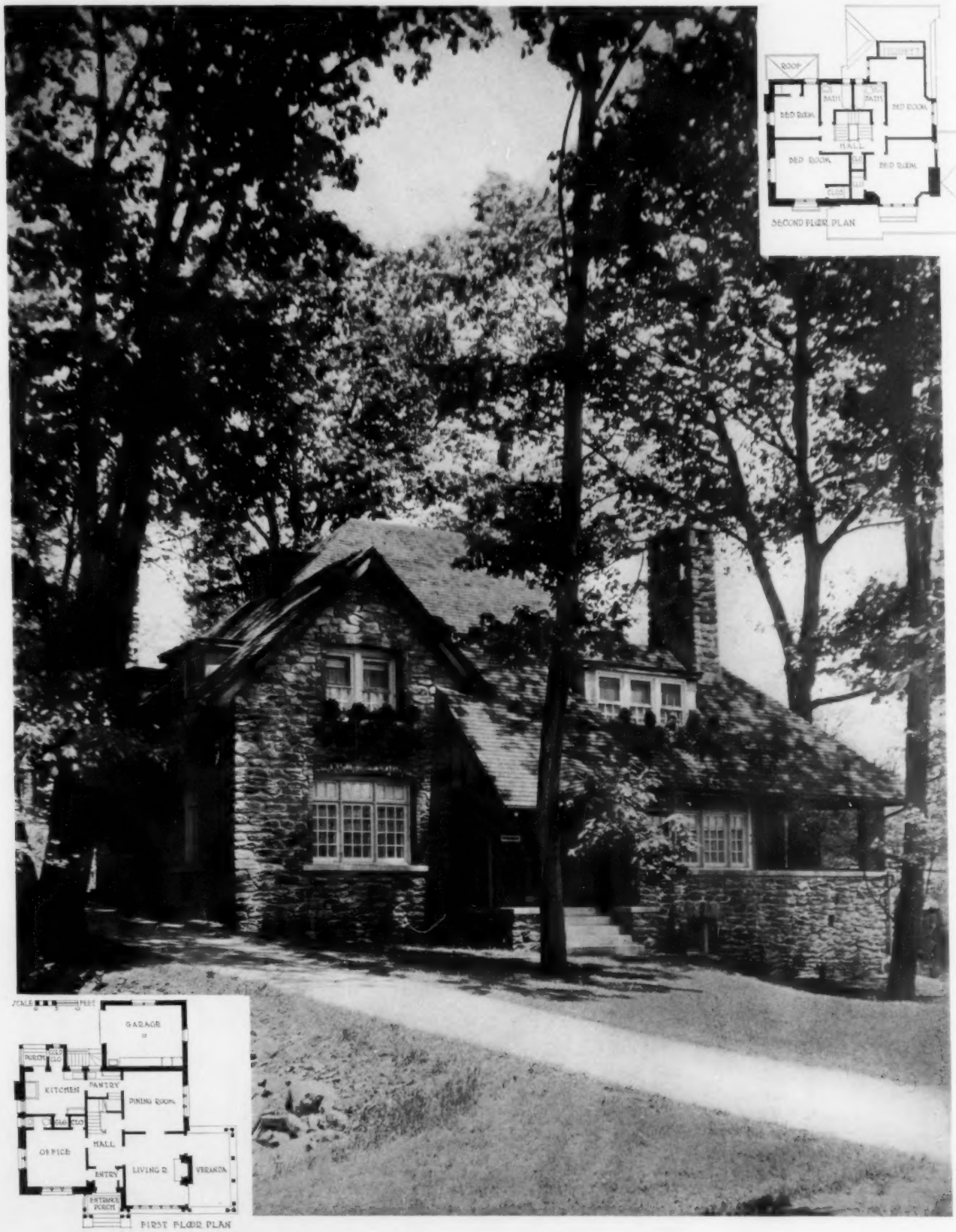
FIRST FLOOR PLAN



SECOND FLOOR PLAN

HOUSE OF FREDERICK J. DAGGETT, ESQ.. WINTHROP. MASS.

CLINTON NOBLE, ARCHITECT

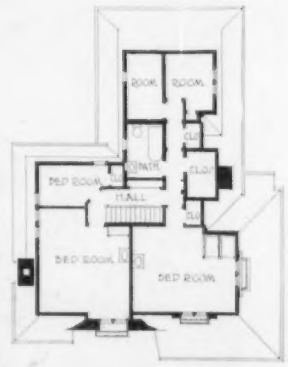


HOUSE OF DR. P. R. HEATON, FIELDSTON, N. Y.

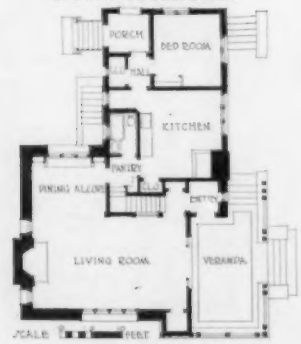
MANN & MacNEILLE, ARCHITECTS

GENERAL VIEW OF COTTAGE AND GARAGE

FRONT VIEW OF GARAGE



SECOND FLOOR PLAN



FIRST FLOOR PLAN

COTTAGE AND GARAGE OF W. D. BALDWIN, ESQ., GREENWICH, CONN

MANN & MacNEILLE, ARCHITECTS

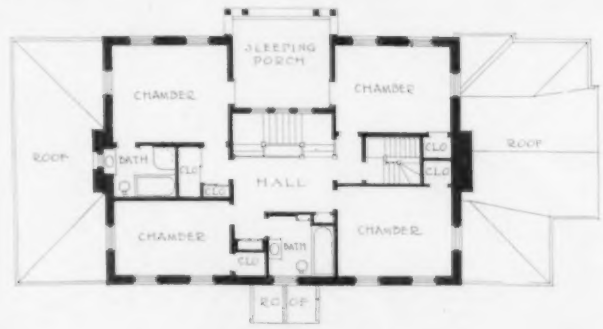
HOUSE OF EDWARD PITCAIRN, ESQ., PITTSBURGH, PA.

HOUSE OF GEORGE J. SCHMIDT, BEN AVON, PA.

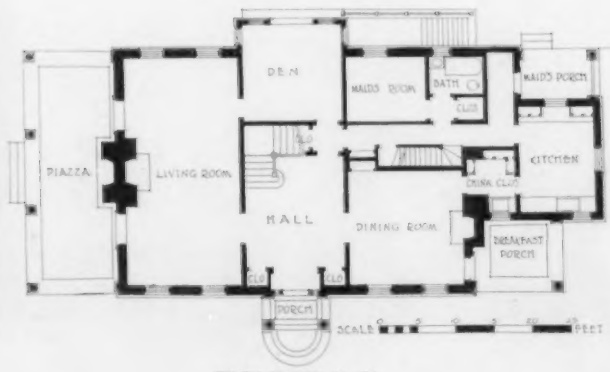
JANSSEN & ABBOTT, ARCHITECTS

GENERAL VIEW FROM STREET

DETAIL OF PORCH



SECOND FLOOR PLAN

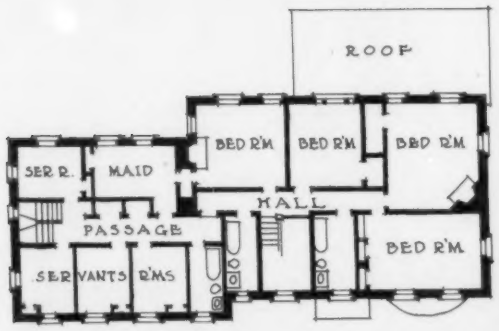


FIRST FLOOR PLAN

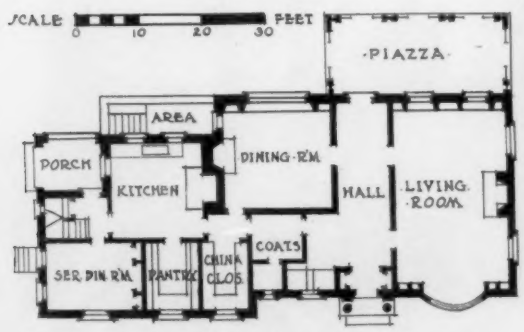
HOUSE OF F. W. NORRIS, ESQ., CAMBRIDGE, MASS.

CHARLES R. GRECO, ARCHITECT

GENERAL VIEW OF ENTRANCE SIDE



SECOND FLOOR HALL



FIRST FLOOR PLAN

DETAIL OF DOORWAY

HOUSE AT BEVERLY FARMS, MASS.

WILLIAM G. RANTOUL, ARCHITECT

GENERAL VIEW FROM PORCH SIDE

VIEW OF ENTRANCE FRONT

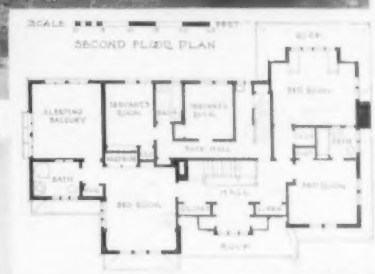
SECOND FLOOR PLAN

FIRST FLOOR PLAN

HOUSE OF J. WOODELL KENNY, ESQ., GUILFORD, BALTIMORE COUNTY, MD.

WILLIAM D. LAMDIN, ARCHITECT

GENERAL VIEW FROM STREET



VIEW OF END AND FRONT

HOUSE OF B. A. BEHREND, ESQ., BROOKLINE, MASS.

CHAPMAN & FRAZER, ARCHITECTS

Description of Houses Illustrated in This Issue

HOUSE OF B. R. DEMING, ESQ., CLEVELAND, OHIO. PAGES 126–128. This house was built in 1915 and occupies an irregular site, which dictated the unusual plan arrangement. The exterior stonework of the lower story was taken from the excavation. The upper stories are of stucco and half timber with a shingle tile roof. The interior is finished in white painted wood, except the living room and hall, which are in natural finished gum wood. The cost of the house was $30,000.

HOUSE OF PROF. A. M. TOZZER, CAMBRIDGE, MASS. PAGES 130–132. This house is constructed of red brick laid in Flemish bond with random black headers. The half-timber work is of oak, pegged together and lightly stained so as to weather. A small amount of limestone finish is used, and the roof is of purple and green mottled slate. The carved ornament as well as the wrought iron work around the doorway follows ancient Maya motifs, recalling the owner's collection of Mexican antiques. The interior finish is principally in gum wood with limestone fireplaces and a gallery around the main hall. The basement contains a fireproof garage which is given the necessary height by raising the floor levels of the rooms above it. The garden is enclosed with brick walls. The cost was about $11 per square foot of first floor area.

HOUSE AT BRAINTREE, MASS. PAGE 133. This house was built with concrete foundation walls and hollow tile blocks above faced with rough textured, vari-colored brick. The roof is of random slate, ranging from purple to green in color. The house is distinguished by its simplicity of treatment and the carefully detailed Colonial doorway.

HOUSE OF MAJOR JOHN M. FRAZIER, ST. JOSEPH, MO. PAGE 136. The exterior of this house is of mixed shades of red brick, trimmed with buff Indiana limestone. The roof is of slate. The interior throughout is finished in pine stained, with the exception of the bed and bathrooms, which are enameled white. The floors in the first story, stair halls, etc., are quarter cut white oak, and those in the bedrooms on the second and third floors are quarter cut pine. The house is equipped with a vacuum steam heating plant and modern plumbing. The plot on which it is located has a very narrow frontage, and this determined the scheme of the plan. The house was built in 1912 and cost approximately $14,000, or 20 cents per cubic foot.

HOUSE OF F. B. EISEMAN, ESQ., ST. LOUIS, MO. PAGE 140. This house was recently erected in a suburb immediately west of the chief residence district of St. Louis. It is built of rough textured red brick, the roof being of green slate. The interior finish is simple, the trim, mantels, stairs, etc., being of birch painted white, except in the living room, where the finish is stained a walnut brown. The floors throughout are of oak with the exception of the service portion, where yellow pine is used; the sleeping-porch, which has a composition flooring; and the sun room, which is floored with alternating squares of black and white tile. The bathroom floors are tile and the walls wainscoted in marble. The house cost complete $19,434 exclusive of architects' fees, or 28½ cents per cubic foot.

HOUSE AT EVANSVILLE, IND. PAGE 141. This house is the home of an architect and is an adaptation of the house in which he lived while a student of architecture in Venice. It is built of interlocking hollow tile covered with plain cement and sand stucco. It is practically fireproof, the first story floors being of concrete construction and the upper floors of mill construction, the heavy timbers encased in plank and mouldings, with the spaces between paneled, giving all the main rooms beamed and paneled ceilings. Over this heavy ceiling construction fireproof deadener was laid, on top of which the finished hardwood floors of the second story were placed. The first story floors are finished with black and white tile and dark red marble. The entrance hall has a barrel vaulted ceiling of plaster with stucco relief. The walls of the hall and living room are of Caen stone. The house was built at a cost of about $8,000, including all interior finish and decoration.

HOUSE OF DR. GORDON WILSON, GUILFORD, BALTIMORE COUNTY, MD. PAGE 146. The lot on which this house stands is 78 feet wide by 200 feet deep. The front quarter is nearly level, but the remainder consists of a very steep wooded hillside. This fact made it possible to utilize the rear of the basement for service quarters, thereby permitting more space to be given to the living rooms on the floors above, with a minimum increase in cost. The basement, the rear of which is entirely out of ground, contains besides the boiler and coal rooms the kitchen, laundry, storeroom, servants' dining room, and a garage and man's room. The exterior walls are of hollow tile faced with a large red brick laid in Flemish bond. The interior partitions are frame. The house is heated with hot water. The cost per cubic foot was approximately 25 cents.

HOUSE OF W. GRAHAM BOWDOIN, ESQ., GUILFORD, BALTIMORE COUNTY, MD. PAGE 147. This house is built of red brick with wood trim and slate roof. It faces north and has a sightly view to the south, which explains the position of the kitchen on the plan. The interior finish is poplar painted white. The house is heated with hot water and has three bathrooms. It contains approximately 59,000 cubic feet and cost about 21 cents per cubic foot, which includes the cost of a small detached one-car garage.

HOUSE OF MISS NANCY S. HOOPER, BROOKLINE, MASS. PAGE 148. This house is built of red brick laid in Flemish bond. The interior finish is mostly in white with Colonial details, except the dining room which is paneled in oak. The whole house forms a good solution of a modern type of dwelling on a small suburban lot. The cost was about $9.50 per square foot of first floor area.

HOUSE OF E. N. SAUNDERS, ESQ., ST. PAUL, MINN. PAGE 151. The architect of this building has met the problem of placing a rather large house on a narrow lot in a successful manner. The exterior design shows a pleasing combination of brick and stucco, the wall construction being of solid brick. The rough dash stucco, gray in color, is set off by the dark red brick which was used for trim around all window and door openings as

well as at the corners of the building, all being laid up in the form of irregular quoins. The terrace across the front is of brick with quarry tile floor. Shingle tile matching the brickwork in color was used on the roof as well as along the top of the walls at the rear of the property. The detail of the doorway is carried out in brick and tile. The interior is in keeping with the exterior design. The large entrance hall is finished entirely in oak with paneled walls and beamed ceiling. The other rooms are quite English in character with ornamental plaster ceilings. The sun parlor is finished with brick walls, having colored tile inserts, the floor also being of tile. The total cost of the house, including garden walls, driveway, and small detached garage, was $42,000. The house proper cost 28 cents per cubic foot, exclusive of interior decoration.

HOUSE AT BEVERLY FARMS, MASS. PAGE 159. This house is situated on a large plot of ground overlooking the Atlantic Ocean. It was originally planned for frame construction with the usual metal lath and stucco exterior covering. At an additional cost of $500 over the frame construction price it was built with outside walls of 8-inch hollow tile blocks with stucco applied direct. The interior partitions are of stud and plaster. The roof is covered with dark brown tiles.

HOUSE OF J. WOODELL KENNY, ESQ., GUILFORD, BALTIMORE COUNTY, MD. PAGE 160. This house is built of 9-inch brick walls laid up with a fairly dark mortar with a raked joint. The roof is mottled green and purple slate of random widths and graduated exposure. The exterior woodwork is painted deep ivory with blue green shutters and metal work. The house contains two main bathrooms with tile floors and wainscots, servants' bathroom in the third story, and toilet in the basement. The house is heated by hot water. It was completed in the fall of 1916 and cost $12,000, including grading and walks, or about 23 cents per cubic foot.

HOUSE OF B. A. BEHREND, ESQ., BROOKLINE, MASS. PAGE 161. The first story walls are of dark red water struck brick with flush joints, every fifth course a Flemish bond course, and walls above cream colored stucco. The roofs are covered with fire flashed red shingle tiles. Exterior woodwork is cypress stained brown, and framing of porch and piazza solid rough sawed cypress, framed and pinned. Piazza and porch floors are paved with red bricks in cement with wide joints. Leaded casement sashes hinged to swing out are used in all windows, except service portions. Walks and runway to garage are paved with blue stone flags in irregular shapes, laid in cement mortar. The garage is of fireproof construction with floors above and below of reinforced concrete. The floors elsewhere are hard pine, the construction supported with steel girders and columns in the basement.

The interior is consistently carried out in the English style of the Jacobean period and simply and suitably furnished in the same spirit. The principal rooms on the ground floor are wainscoted to the ceiling in plain oak with moulded stiles and stopped chamfers, pegged with wood pins after the manner of genuine Old English paneling. The ceiling in the hall is of adzed oak beams with rough plaster showing between. In the dining room, opening from the hall by glass doors, the same style of paneling is repeated, and the ceiling is carried out in geometrical design in plaster, modeled after the ceiling in the famous Elizabethan Feather's Inn at Ludlow, England. This ceiling is kept very flat and delicate in relief, as the rooms are quite low, only 8 feet in the clear. All the interior oak is finished in a brownish gray color. The furniture is finished to match, and in the dining room a sideboard of Jacobean detail is made a feature of the design. The floors in the first story are of rich red tiles with dull glazed colored tiles sparingly introduced in borders and medallions, and a base of black slate. The kitchen floor is of vitrified white tiles with sanitary base, and all bathrooms have tile floors and walls tiled 7 feet high. Heating is by a direct hot water system with thermostat control and radiators concealed in principal rooms in recesses behind specially designed oak grilles.

LIBRARY

DINING ROOM

HOUSE OF B. A. BEHREND, ESQ., BROOKLINE, MASS.

CHAPMAN & FRAZER, ARCHITECTS

EDITORIAL COMMENT AND NOTES FOR THE MONTH

THE splendid spirit manifest among the people of this nation to do their share in the work that lies ahead is nowhere more enthusiastic and sincere than within the ranks of the architectural profession. Already many of the younger men are in camps training to become officers, while others are preparing themselves individually or organizing collectively to render some helpful service. Preparation for war in a country which has been fortunate in having years of peace, and composed of groups of people with such diverse antecedents as is the United States, must of necessity be a slow operation. The work to be done by particular bodies of trained men cannot be determined at once, and many adjustments will be necessary before a complete organization, in which every loyal citizen will do his part, can be perfected. It is of great satisfaction to note that architects are keenly cognizant of the efforts which must be made, and are not waiting at one side to be told their duty, but are keen to see a need and to use their ingenuity to meet it with splendid vigor.

The Architectural League of New York has indicated its eagerness to serve by organizing a Food Battalion for the cultivation of about fifty acres of vacant land at Forest Hills, Long Island. This work is to be carried on with the co-operation of the Mayor's Food Committee of New York and under the direction of the Agricultural Department of the Long Island Railway. The battalion will be made up of volunteers from the members of the League and their office assistants. It is expected that there will be at least two hundred volunteers.

The organization will be managed by an executive committee, each member of which will be chairman of some subcommittee. The battalion will be divided into squads of twelve or fourteen men each, operating under the direction of a corporal. Each corporal is provided with a card for every member of his squad, and each member is likewise provided with a card upon which is kept a record of his time spent in actual work and which is O.K.'d at the end of the month by the corporal. It is expected that the work of the battalion will produce not only a good sized crop, but give the men the benefits of outdoor exercise and considerable practical knowledge of agriculture. The men are to give one week of their vacations, the time to be distributed over three and one-half months, each man working one day in each alternating week during this period with the usual salaries continued by employers during this period.

ATTENTION is called to the fact that the New York state law regulating the practice of architecture has recently been amended.

One of the amendments extends the exemption period, whereby certificates of registration may be issued to architects who were in practice previous to the enactment of the original registration act, namely, Apr. 28, 1915. Any architects who were in practice in New York state previous to that date may now secure certificates provided their applications are filed before Jan. 1, 1918, and provided such applications are approved by the Board of Examiners. Application blanks may be secured by addressing the Department of Education, Educational Building, Albany, N. Y.

One of the amendments of interest to architects of other states reads as follows:

"Any architect who has lawfully practised architecture for a period of more than ten years without the state shall be required to take only a practical examination, which shall be of the nature to be determined by the state board of examiners and registration of architects."

Another amendment of interest to those of other states contemplating similar legislation is:

"but this article shall not be construed to prevent persons other than architects from filing applications for building permits or obtaining such permits."